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Galileo

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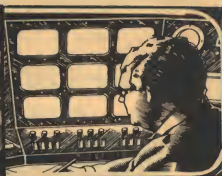
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Contents

Top row: Brian Aldiss, Felix Macguire, Tansonel (the small one at the bottom of the heap), Adora, and Carl Sagan. Bottom row: Lee Killough, Joseph Huto, Robert Chilson, and Simon Cabot.



Articles

NAMING OF THE SOLAR SYSTEM By Carl Sagan. 16

What's in a name? Considerably more than one might think, particularly when the international scientific community becomes involved in the christening. Cornell's noted astrophysicist provides a behind the scenes perspective on how the game is played.

INTERVIEW: with Kelly Freas by Brian Fraser 10

"The people who imitate me, imitate my mistakes. . ." Hugo award winning artist Kelly Freas opens up for his Canadian interviewer, frankly admitting his feeling and allowing insight on his work.

FUTURE VISION by Greg Bear. 72

Let a Bear into an art gallery and watch the paint fly. Recognizing the increasing importance of the illustration to Science Fiction, we offer this initial foray into the field of art criticism.

2 GALILEO

Short Stories

ADORA By Robert Chilson. 40

An alien playmate and now his wife, Adora was the embodiment of his dreams. Her presence compensated for the pioneer loneliness and her strange ways converted each frontier sunrise into a moment of joy. Nothing could separate them, . . . except, perhaps, reality.

TITAN BASE By A. J. Giambra. 52

Black vacuum, frozen ammonia and jagged peaks were the most hospitable vistas Titan revealed to explorers. Instant death was the reward for any mistake, however slight. But the most dangerous foe was not of Titan born.

NIGHT CALLERS By Kevin O'Donnell, Jr. 60

More often than we wish, diplomacy is practiced at the point of a knife. For Simon Cabot, this was something more than a philosophical dilemma. He had to negotiate or die.

Short Stories

STALKING GAME By Lee Killough. 67

Only meters separated them. Carlo Emre had spanned light years to hunt the great beast and now the moment of truth had arrived. But truth, he would learn, finds its own time and place to be revealed.

Novelette

WHERE THE LINES CONVERGE By Brian Aldiss. 25

Body language is a subtle thing, and it may take a patient eye for nuance to interpret its unique linguistics. A man may not even know his own blood in this tale to curdle mother's milk.

Poetry

'N' By Ray Bradbury 48

The *Nautilus* once again prowls the seas, Captain Nemo at the helm. Prose master turns poet and recalls how the Jules Verne hero haunted childhood dreams on his misguided quest for peace.



Departments

EDITORIAL by Charles C. Ryan. 4

With our third issue, things look good for the new kid on the block, but he had better keep his nose clean.

PROFILE. 6

Introductions to the men and women who created this issue.

ENCYCLOPEDIA GALACTICA 78

The U.S.S. Enterprise is about to get some competition from Private Enterprise, and more. . .

THE ALEPH: by Andrew Adams Whyte. . . 82

Despite overwhelming odds, not to mention the odds, Drew offers his latest preview of upcoming SF books.

REVIEWS. 88

Scanner Darkly by Philip K. Dick
Walkers On The Sky by David J. Lake
The Sword of Shannara, by Terry Brooks, and more. . .

TELESCOPE. 94

What's coming up in future issues.

Departments

INQUISITION. 92

Readers speak their minds, (toes, and elbows,) all with the best of intentions: letters to the editor.

CLASSIFIED. 95

From bazaar to bizarre.

STAR CHAMBER. 96

A portrait of Robert Silverberg, his pen silent, but his voice loud.

COVER ART

Tom Barber gives us two more outstanding illustrations.

ADVERTISERS

Doubleday.	FC
TSR Hobbies.	1
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Personal Computing.	19
Delap's F&SF Review.	23
Fiction.Magazine.	75
Back Issues.	76
Creative Computing.	77
Asimov's.	81
Galileo Prize.	85
Pocket Books.	91

The Magazine

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Charles C. Ryan

Editorial

Our goal still lies ahead, tantalizing, encouraging us to recognize our initial issues for what they are. . .



WE'VE BEEN DOING everything wrong. When *Galileo* was conceived, we opted for a small printing and a controlled growth rate. We haven't crammed newsstands with copies of our spunky little magazine. There are no "big names" gleaming on our dedicated staff roster for we felt no need to put chrome on a VW. The advertising budget is a modest in-house joke. We reintroduced "lost" and "rare" material into our pages in the form of articles, plays, poetry. We have almost as much non-fiction as fiction. Etc.

Despite all these seeming handicaps (We think of them as our assets.) *Galileo* is successful. So successful, in fact, that the first issue is now "officially" sold out—everything but the press "overage" on the 8,000 copies we printed. (We've had to double the price on those few remaining copies so serious collectors will have the chance to complete their sets.) For all this, we thank you, our readers. Without your continuing support and that of the authors and illustrators who have quixotically entrusted their work to us, success would not have come.

Please don't imagine this small bit

of progress will make us fat, sassy, or somewhat contented. It won't. In our first issue we explained the spirit which motivates us, the quest for new knowledge, the passion for better and better stories. . . literature, if you will. Our goal still lies ahead, tantalizing, encouraging us to recognize our initial issues for what they are—the first steps on a long journey.

When we set out, we pledged to improve *Galileo* with each issue. Our second issue was 16 pages longer than the first. This issue, as you may have already noticed, is on a whiter, higher quality paper. And so it will go, each issue, each step, reflecting part of that promise.

For the moment, let's go back to the things we are "doing wrong." In the field of publishing, very few magazines sell more than half of the copies placed on newsstands. Those not sold go into the wastebin as they are not returned by distributors. We gave serious consideration to the waste of energy, natural resources and finances involved in this method of distribution and decided against it. The only bookstores where you'll find *Galileo* are the ones who return whole copies. Nothing is wasted.

In our planning of *Galileo* we deliberately decided to seek out and present "lost" work which, though good, never appeared in what might be considered science fiction markets. Very few of even the long time readers of SF have seen these articles, plays, fiction, and poetry before. (Even in mainstream literature, very few buy poetry books.) To be honest, even though 95% of our mail has been enthusiastic, we have received some criticism directed at our "reprints." Rather than be swayed by the few, however vocal they may be, we would like to know what you think. Should we or shouldn't we continue to seek out these rare manuscripts? Let us know.

Lest you worry about the apparently "late" delivery of issue No. 2, the explanation is simple. The U.S. Snails—as Robert A. Heinlein refers to the postal service—lost over 5% of our subscribers' copies in the first issue's mailing. To avoid even greater losses, we postponed mailing issue No. 2 until after the Christmas card crunch and have officially changed our publication schedule to April, July, October and January to avoid future problems as

Continued on page 91



IT SURE WAS THE GOLDEN AGE OF COMIC STRIPS!

The 1930s saw the growth of a special entertainment medium: the adventure comic strip. Of dubious parentage (both the dime thriller and the movies were blamed), the lusty waif enjoyed no more than twenty years of fame before the onslaught of his own legitimate offspring, the TV adventure show.

Popular culture scholar Ron Goulart (known also for his prizewinning fiction) opens the yellowing pages of yesterday's newspapers, flipping past ancient front-page stories about dictators and New Dealers, to alight on the meaningful pages—the comic strips. Among those he brings back to life (helped by numerous illustrations): **BUCK ROGERS**. As the 20s ended, Anthony Rogers went to sleep, to wake up in the 25th century.

TARZAN. The jungle lord was given a leg up by his chief chronicler, the amazing Edgar Rice Burroughs. But never forget the contributions of artists Hal Foster, Rex Maxon and Burne Hogarth (whose drawings of the titled apeman were displayed in the Louvre).

AVIATION STRIPS. Smilin' Jack, Tailspin Tommy, Skyroads, Scorchy Smith, Flyin' Jenny and Barney Baxter ("approved by the Junior Birdmen of America").

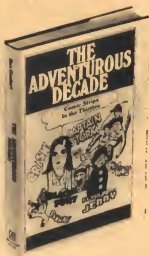
GANGBUSTERS. Dick Tracy, of course. And Dan Dunn, Secret Agent X-9 (created by Dashiell Hammett and Alex Raymond), Radio Patrol, Red Barry.

CAPTAIN EASY. Above and beyond its superior draftsmanship, this mock epic influenced many another feature.

FLASH GORDON. Drawn by Alex Raymond, perhaps the seminal and certainly the most admired of all strip artists.

THE WAY WEST. With the exception of Red Ryder, cowboy strips were inked by city fellers who had never thrown a leg over a saddle. One strip, in fact, was drawn by a New Yorker cartoonist.

Urbane, scholarly (chockful of actual interviews with Milton Caniff, Alfred Andriola, Roy Crane, et al.) and appreciative, *The Adventurous Decade* is a warmhearted, careful study of one of yesterday's innocent pleasures.



Some of the Very Special Pleasures in This Illustrated History of the Comic Strip's Greatest Years

- Rare strips, never seen before in any book: Jim Hardy, Bobby Thatcher, The Red Knight (the only superhero created directly for newspapers)
- Authentic Scorchy Smith strip by Noel Sickles (of course) plus Bert Christman (try to find his work in any book!)
- Sickles—for the first time—talks about Scorchy and about life with Milton Caniff on Terry and the Pirates
- *Art Treasures of America* (well, almost). Reminiscing about Hairbreadth Harry... Minute Movies... The Gumps... Vintage Funnies... Prince Valiant... The Phantom... Brick Bradford... Jack Swift... Skyroads... Little Orphan Annie... Annie Rooney... Frankie Doodle... Joe Palooka... Joe Jinks... The Spirit... Miss Fury... Don Winslow... Roy Powers
- The Way West. Yes, yes, there was the Lone Ranger. But do you remember Bronc Peeler, Tex Thorne and White Boy?
- Dan Dunn Sunday strip drawn by Alfred Andriola (Andriola himself has no sample of this strip!)
- Coulton Waugh—his last interview. Plus interviews with Caniff, Andriola, Roy Crane, Dick Moore, Mel Graff, Leslie Turner
- Tarzan Every Sunday. The jungle lord's newspaper adventures were more complicated than any encounters with pygmies or rogue apes
- Roy Powers strip, ghosted by the celebrated Frank Godwin
- Rare advertising pieces for Wash Tubbs and Terry and the Pirates
- The 500-Year Nap. How Buck Rogers went to sleep in the pages of *Amazing Stories* and woke up in the funnies. Plus career studies of Dick Calkins, Phil Nowlan and the other swell guys in the Buck Rogers engine room
- The Depression as Fertilizer: how the rich loam of the 30s nurtured the comic strips
- Cops and Robbers. While public enemies grimaced on the front page, the good guys pursued the bad guys back in the funnies: Dan Dunn, Secret Agent X-9, Radio Patrol, Charlie Chan, King of the Royal Mounted, even Inspector Wade of Scotland Yard
- Glenn Chaffin tells you how he helped create Tailspin Tommy back in the 1920s
- The Life & Times of Flash Gordon. Alex Raymond wasn't always going to ghost Tillie the Toiler. He had dreams
- Terry and the Pirates. Of course Milton Caniff never went to the Far East. It would have spoiled everything
- It's Superman!—soaring from the pages of a comic book into your local paper
- Boys in Uniform. A war can be just the tonic for an ailing comic strip
- Keep On Reading. Ron Goulart's Pick of the Best. Where to find more on adventure strips, including a rundown on reprints, collections and publishers (with addresses)
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Clockwise from top left: A.J. Giambra, Ray Bradbury, Brian M. Fraser, and Greg Bear.

Pro-File



We present a constellation of stars in this issue...pulsars, red giants, quasars, and here and there a nova.

Among science fiction luminaries, **BRIAN ALDISS** has an immeasurable absolute magnitude. His works include novels (*Frankenstein Unbound*), innumerable short stories, and even an opera (*The Eighty Minute Hour*). He prefers that we not write about him. "Such things should be left," he tells us, "until the writer is dead." He is rather bemused, if not altogether resentful, that three people are currently writing books on his work. "I have a long way to go yet," he writes, "and will not be summed up." He is consistently unable to keep people from writing about him, however, and he must rank with H.G. Wells as one of the most "criticized" writers in the field. His new book, *Malacia Tapestry*, (which he considers his best) is soon to appear from Harper and Row. "Where the Lines Converge" is bound to set readers researching his and their ancestry.

In the next position we have an uncatalogued binary named **GREG BEAR**. Mr. Bear works successfully as both a writer and an illustrator.

Drawing on traveling experience that has taken him from Rhode Island to Japan (and a lot of places in between), he has been writing since the age of eight and drawing even longer. He sold his first story at fifteen, and his first cover rather later. He has published in several science fiction magazines and has the distinction of doing the cover illustration for one of his own stories (now in the works at *Galaxy*). His outspoken views on science fiction art and artists is likely to bring many contemporary stars to the critical state. Let's hope he isn't scorched when the novae occur.

Astronomers have long since given up trying to measure the proper motion of **RAY BRADBURY**. When last observed, he was conducting an interview with Jules Verne in *Galileo* issue number one. He appears in these pages with a provocative poem of "N"—a childhood hero. Author of some of the most well known science fiction ever published, Mr. Bradbury has credits extending from films (*Farenheit 451*, *The Illustrated Man*, *Something Wicked This Way Comes*) to an honest-to-goodness literary anthology (*The Vintage Bradbury*). He is widely re-

garded as a writer of "literature" (i.e., material suitable for "literary criticism") whose subjects just happen to be rather unreal...rather than a "science fiction author." But he still has a broad and tenacious following in science fiction. Fans were the first to sight him and can lay claim to precedence, as rightfully as Galileo claimed the moons of Jupiter.

In apparent proof of Hubble's Law, **ROBERT CHILSON's** red shift began at age eleven, when he felt mature enough to begin writing for the second time (how's that for an early start?). The science fiction universe has been expanding ever since. And he is a parsec of published work (including an astronomical unit of novels and a light-year of short stories) beyond his first attempts. He feels he owes his training to the editorial hand of the late John W. Campbell, who published many of his stories in *Analog* in the period 1968-1970. Campbell stopped buying, however, when the author's style began to change and his stories were less suited for *Analog*. "Campbell was very patient with me," writes Mr. Chilson, "criticizing work he and I knew could not be printed in his magazine." He ad-

mired Campbell very much and says he was greatly affected by his death. "Adora", in this issue, is definitely of non-*Analog* genesis. At the rate his reputation is expanding, we are fortunate to publish him before he reaches the optical limits of the universe.

Making the transit of Kelly Freas, we have **BRIAN M. FRASER**, a newly-discovered variable who tends to appear unexpectedly in magazines, at conventions, and teaching classes. Mr. Fraser is a Canadian writer who doubles as a critic. He teaches a course on science fiction at the University of Ottawa, consults with over fifty colleges and universities on the content of their science fiction courses, and is known for his presentation ("ESS EFF: Teaching Science Fiction in the Media") at the Eighth Annual Conference of the Science Fiction Research Association, of which he is a member. When not engaged in teaching, he writes professionally on computer communications. In this issue he interviews the best-known illustrator in the field of science fiction.

As for **FRANK KELLY FREAS** himself, his style is—like Venus in the evening sky—recognizable to both experts and laymen. Mr. Freas has no less than nine Hugo Awards to his credit. His work has appeared in and on virtually all of the significant science fiction publications as well as other places (remember his drawings in *Mad* magazine?). Mr. Freas made his science fiction reputation with *Astounding* and now claims to be entering his finest artistic period. We don't see how his albedo can exceed its present value of one hundred percent.

A. J. GIAMBRA became visible even without the aid of photographic plates. Born and raised in Buffalo and a graduate of Canisius College, he has been writing most of his life. He wrote full time for two years, he tells us, and found it to be a learning experience. And, although he is currently attending computer programming school, we can expect to see a novel from him eventually. Let us hope science fiction will not lose him to the easy profits of gainful employment. Mr. Giambra admires Roger Zelazny and Ursula K. LeGuin, and appears to be influenced by Larry Niven in spite of himself. "Titan Base", his first published story, should goad readers into insisting he remain away from the labor market.

We have received more than just

radio emissions from **KAREN LEE KILLOUGH**, who tells us she has been writing all her life but only recently began submitting for publication. Encouraged (if not goaded) by a husband/critic, she sold her first story in 1969 and was given Honorable Mention by Terry Carr in *Best of the Year No. 4*. She lives in Kansas with her husband, where she spends some time working in the Radiology Department of the local veterinary hospital. "I'm fascinated by life in all its forms," she writes, "real and imaginable."

The supernova **KEVIN O'DONNELL** has been observed on previous occasions in *Galaxy*, *Analog*, and *Galileo*. Born and raised in Cleveland, he has lived in Hong Kong and Taiwan and went to Yale. About his personal life, Mr. O'Donnell writes: "I have no odd habits—odd friends, yes; odd habits, no—it's the habits of the rest of the world that are odd...I do have dislikes: suits and ties, early risings, commuting, gainful employment..." He is working on a novel but seems to think *isn't everybody?* In "Night Callers" he explores some of the odd habits we employ in foreign (or is it alien?) relations. His work is already gaining prominence in the night sky.

Completing our constellation is **CARL SAGAN**, the Renaissance Man of modern space science. Dr. Sagan is Director of the Laboratory for Planetary Studies and David Duncan Professor of Astronomy and Space Sciences at Cornell University. He is also Associate Director of the Center for Radiophysics and Space Research. He has held academic posts in astrophysics, astronomy, and genetics. Author of 350 or more articles and author, co-author, or editor of more than a dozen books, he is an authority on exobiology, communication with extraterrestrial intelligence, the physics and chemistry of planetary atmospheres and surfaces, the origin of life on the Earth, and space vehicle exploration of the planets. Among his many accomplishments, Dr. Sagan takes pride in being responsible for placing the famous interstellar message on *Pioneer 10*, the first spacecraft to leave the solar system. "The Naming of the Solar System" is an entertaining account of the history of planetary nomenclature. As our knowledge of the solar system expands, we should have a rational method for naming things in it. We can't think of anybody more qualified to make the point.



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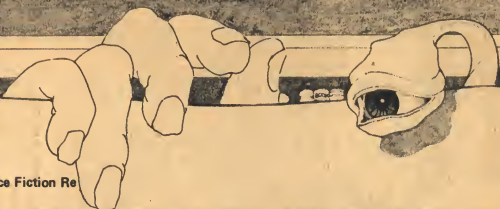
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Dear Science Fiction Re

There is a new direction in the field of Science Fiction. The early period, the time of Gernsback, Burroughs and robots, gave way to the middle period of interstellar travel, Russell and Campbell. Now a new wave of authors, led by the most farsighted of the 'old timers' is taking Science Fiction into its young adulthood. Experimentation is now mixed creatively with the tested craftsmanship of the masters. The great work of the past is now the foundation of the future. The best is yet to come, and GALILEO is where you'll find it.

GALILEO, a new Science Fiction quarterly (destined to be monthly), will be available only through subscription and a few select bookshops around the country. This select distribution avoids the wasteful mass-marketing practices which caused the financial ruin of many a fine old magazine. GALILEO's cost, \$1.50, reflects the quality of our contents, design, illustration, and most importantly, writing. Each issue of GALILEO is a unique blend of exciting Science Fiction and controversial articles on the frontiers of science fact, plus reviews.

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Brian Fraser

KELLY FREAS: interview

Writers, by and large, are visually illiterate—almost as bad as editors!



ARTIST FRANK KELLY FREAS is the winner of an unprecedented nine HUGO Awards, including the 1975 Hugo as Best Professional SF Artist at the MIDAMERICON, the World Science Fiction Convention held in Kansas City over the Labour Day weekend.

The name Kelly Freas or his unique initialled signature have been familiar credits in the world of Science Fiction since he first began drawing illustrations for *ASTOUNDING Science Fiction* magazine in the early 1950s.

Brian Fraser, professor of an SF in the Media seminar series at the Institute of Social Communications, Saint Paul University and the University of Ottawa in Ottawa, Canada, recently interviewed Kelly Freas and his wife Polly at their home in Virginia Beach.

FRASER: Do you read every manuscript which you illustrate?

FREAS: Every single one. Not only read it—I read it, Polly reads it, we discuss it, then I read it for the second time, then I make notes on it, decide possible areas that might be illustrated. We'll discuss it again and pin it right down to what would do the cover.

FRASER: Do you then submit a preliminary sketch to your client?

FREAS: Well, with most of my clients, editors, I submit three or four very carefully, very precisely-rendered paintings—which are essentially the cover in actual size. I work to the real size of the picture and make them as detailed as possible. Because editors, by and large, have no visual sense whatever.

They're writers; they're not artists. They have to see what you're talking about. You can't just say "this is going to be magenta and this is going to be vermilion and this area will be yellow ochre." This is gobbledygook to them.

So you show them. This is the way it is going to look when it's printed.

Then, from those, they decide what suits their purposes the best. And usually the circulation department and the advertising department and—God only knows—sometimes even the office boy gets his opinion in there.

But having decided from that point, they pick one. They may say they want the background from this one, the foreground from this one, but we like this spacehip from Number Three so put it in the middle there.

FRASER: That must make it difficult

to integrate.

FREAS: Sometimes, it does. Ordinarily, I've worked enough so that I have almost designed things so that they are interchangeable. Sometimes, in fact, I will paint a background and do the middle distance on an acetate flap. These are two things that I know have to be included. And my characterization of the hero could be on a third surface, a second acetate flap, so that I can just lift off and juggle one from the other.

Ordinarily, I don't take that much trouble. It's only when I have a very complex problem. This could very well apply to Gordie Dickson's novels, for instance, where there is such an infinitely varied background, such specific characters and, at the same time, so much very specific, very detailed and very important—very story important—action. You can find yourself getting into all sorts of complications. I've got stuff on Gordie Dickson's stories that won't be used for fifteen years. FRASER: On Dickson's Dorsai or Childe Cycle?

FREAS: Yes. But eventually, I hope that I will get to do the whole Dorsai Cycle. And when I do, all this will be-

come part of it.

FRASER: Do you then work with the writer on any of your art?

FREAS: Writers, by and large, are visually illiterate—almost as bad as editors! Their specialty is different; their specialty is verbal. And the connection between the verbal and the visual is very tenuous at the closest.

The concept that a picture is worth ten thousand words is very valid. But, there is a corollary to it, too. Some words are worth ten thousand pictures. You have to recognize where the verbal is inexpressible in visual terms and where the visual is inexpressible in verbal terms. My department is the visual. So I will try to give you the thing that an author cannot put into his story in less than 5,000 words. But I will give to you in a glance, something that will communicate itself.

Gordie Dickson is the only author that I allow to have anything to say about the illustrations that I do. FRASER: How long does it take to complete a cover painting?

FREAS: The question of how long it takes to do a given picture is a very complex question. Because you must include in this reading time for the manuscript, time that you spend on

research, time that you spend dragging up ideas. Every once in a while, one pops up that I will do in an afternoon, and I'm not kidding, literally, a cover in four hours! But this will be balanced off by one that takes me three solid weeks of work to do.

So you can't say that a given picture takes a given amount of time. What you have to figure is an average, over a six month period. Polly, how many covers would you say I would produce per month, three-to-four, five-to six?

POLLY FREAS: About four to six.

KELLY FREAS: Four to six per month, and this would be in addition to Black-and-Whites—interior drawings—and whatever commercial jobs I happen to do in addition.

The requirements of each job are so different that, quite literally, when I sit down to a piece of blank illustration board, I don't know what the hell I'm going to do! I am just as blank as that board!

I have made more or less a technique of this over the years. Because I know I have developed a style. But I try to avoid a style. And that, of course, is the basic element in the Kelly Freas style, I hope.

The people who imitate me, imitate my mistakes, which is fine. These are the things of which I am not aware. They are, and they do something with them and make them useful. But, for me, it is far more desirable to so-to-speak hang loose, so that each problem that I approach is a brand new one. This way I don't get tied down to any particular format, any particular psychological bent. I can approach each problem as a new one and constantly entertain myself—otherwise, I'd get so bored I'd have to do something else. Well, Science Fiction is one of the very few areas where you can do this, when you stop to think of it.

My new project of Laser Books in which I have a very specific layout: this size, this shape, type goes here, credit goes here, face goes here, action goes here.

FRASER: Do you find that limiting?

FREAS: Not in the least bit! I find it delightful. Because for once in my life I don't have to think about layout. I don't have to think about anything except communicating the idea of the picture. And this is a real joy.

I can concentrate on the characterization of this space, and action in the background that, for me, my effort is



Kelly Freas

always to synthesize the basic thrust of the story.

My employers, clients, the people who pay the bills, quite frequently have their own ideas. They want *violent action, brilliant colors*. They want *sex or bloodshed*, any sort of thing that appeals to them, they want in this background.

No! This is not what the background picture requires. What the background picture I want to get is one that gives the very basic feel of the story that the reader is about to get. When he looks at the cover, he knows what to expect from the story, if I'm successful—sometimes, I'm not.

FRASER: Are there other commercial restrictions or limitations? For instance, do certain colours help to sell a book? FREAS: Quite frequently, they do. And, curiously enough, colours have fashions.

There was a period, some years back, when one of the publishers—who shall be nameless—ran a survey and discovered that yellow covers sold more than anything. Instead of just keeping this close to the vest, he decided he had made a real discovery here and published it.

The result was that, for about the next six months, everything that you saw had a yellow cover on it.

Then some joker came along, and this guy was really a smart one. He saw that everybody had yellow covers, so this month he brought out four books and, if I remember it correctly, one had a dark red, one had a dark blue, one had a dark green, and one had a *black* cover. He just swept the market completely clean; nobody sold anything that month except him.

Of course, immediately, within the next six weeks, everybody was on the market with a brilliant dark cover that would contrast with all this yellow junk that was being shown. That was the last time when that ever happened, because it was so obvious what was going on that even the various nitwits in the circulation departments could get the message.

But we still have the proposition in ANALOG—get a copy...or you can visualize it yourself. You've got the title and the body of the picture, with the price up in the upper right-hand corner. Now, according to their Circulation Dept., there must be something of importance, something to attract

your eye into this upper right-hand corner.

Hence, we have a tiny rocketship there, or a spot there, always something up in this corner—perhaps an arc of colour which carries you up into there.

Now you know, and I know, that this couldn't matter less. But the Circulation Department doesn't know that. So we go along with them. I've got to make a living, too.

FRASER: Is it difficult to get a single picture to depict a story, especially when it's part of a larger series? FREAS: Well, let me think of one. *Pussycat* would be one—SWAN SONG by Brian Stableford. You have to know not only that story, but you have to have the whole background of the series. And yet, in one picture, it has summed up that whole feel of the last story. So that this is something that communicates on one level to the reader who has followed this whole series of stories and understands it; and on a second level to the guy who's running for the 5:15 and is just grabbing for something as an alternative to PLAYBOY, which he's already read.

Thus, I am constantly working on at least two levels. Because I'm a Science Fiction fan, I'm not satisfied with anything that I turn out that doesn't satisfy other Science Fiction fans. And, at the same time, I recognize that if we are going to have books to read, we damn well better sell the newsstand buyer—who is not a Science Fiction fan.

FRASER: Do you find it difficult to keep your artwork consistent on along range series, remembering stories which happened in the past which you illustrated, and which may have to be consistent with what's coming in the future?

FREAS: It depends on what you mean by 'consistency'.

If you're thinking in terms of an artistic or technical consistency which would be required if you're going to do twelve illustrations, a book jacket and a frontispiece for a book, this is no problem at all. Once you get started in that direction, everything goes the same way.

On the other hand, if you're doing a three or four-parter for ANALOG, you may find that you may not feel the same way about it on the second month as you did on the first one. And I have, I suppose you could count twenty stories, in which each

instalment was illustrated not only in a different method but in a different medium. I do not feel, in that case, that consistency is any particular virtue.

The consistency that I do require from myself is of an understanding of the story.

FRASER: How did you first get interested in Science Fiction?

FREAS: You know, the truth is, I've given so many answers to this question that, at this point, I don't really know. But I can look back and tell you what happened.

I grew up in Canada; I didn't leave Canada until 1939. I was born in New York but I came to Canada when I was about five. I grew up in Canada and went to school there in Ridgeway, Ontario, which is way up on the North shore of Lake Erie, about twenty miles west of Niagara Falls. It was a place that nobody would ever know was there, believe me, but it was rather nice in those days anyhow.

At Crystal Beach-on-the-Lake, there was a big resort, a big amusement park where everybody came for the summer. My uncle ran a photo store/studio there. He was probably one of the very few people in the town who didn't go on relief the day after Labour Day because he and the postmaster and the mayor, the reeve, they were the very few people who had a little bit of money to spend through the winter while the rest of us had trouble.

My uncle got ARGOSY and LIBERTY and all the interesting magazines of the early Thirties. He would never let me borrow them but I was allowed after school to come and sit in his kitchen and read them. And I devoured John Carter of Mars and Carson of Venus and—God only knows what-all else—and had an absolute ball! I loved those things!

By the time I was eight years old, I was really hung up on Science Fiction. I used to travel back-and-forth quite frequently between New York and Buffalo since I had to come across to Buffalo to get the train to New York. They would always give me a dollar to buy sandwiches or whatever I needed on the train. Out of that dollar, twenty cents invariably went for a Science Fiction magazine—usually ASTOUNDING.

I didn't start buying ASTOUNDING, keeping it that is, until they



started trimming their edges. When they started trimming, I started collecting. I don't know exactly what it was about that raw edge—it was just a plain old pulp magazine and I wasn't interested.

But once they got the trimmed edges, then I started collecting and I had a complete collection from about June of '39 right up to 1964 when I sold my Science Fiction collection and inadvertently included all my file copies with it. I've been trying to replace my file copies ever since. FRASER: Were you always interested in the art aspect as well? Did you start out as an artist?

FREAS: Oh, yes. I'd been drawing since I was "yca-high." My mother has my first drawing, which was sort of wiggly line labelled "worm"—with the 'r' backwards. She taught me to read and write when I was about four years old. That one was the first thing and she's got all sorts of stuff like that. I was always serious about drawing. I always wanted to be an artist—just nobody wanted me to be one, that's all, they wanted me to take up a 'respectable' profession.

I can remember very distinctly my mother and father, when I was in my teens and had applied, sent in an entry to one of these "Draw Me" contests. Some joker turned up with a great portfolio to convince my parents that I had outstanding art ability and they must spend \$30,000 to put me through his course. They weren't about to have any of this. So after we shoed him out, they sat me down and talked to me. And said, "We understand that you have a great deal of talent, and we always thought that you did. But don't you think it would be a much better idea to learn a good profession, like radio repair, or auto mechanics, or aircraft building? Then you could do your artwork in your spare time and on Sundays."

FRASER: What did your father do?

FREAS: He was an aircraft engineer. So he got me a job in an aircraft plant. I turned in a few illustrations for the plant magazine and I was active in all the extra-curricular things, the dramatic clubs, the bowling leagues.

Trouble only began when I got active in the union. Then, somehow, somebody or other discovered that, because I was a reasonably good illustrator, I might be of value in the

public relations department. And, if I were employed in the public relations department, I would be ineligible for membership in the union and I'd shut my big fat mouth. So that is exactly what happened. They doubled my pay, put me in public relations and I wasn't about to argue.

So I stuck with that until I went into the service. I went through the same sort of thing in the service. I volunteered for the Engineers because I wanted to go into camouflage. I figured this would be where I would be most useful. I ended up in the Air Force as a photographer—where I was completely useless.

But I painted a lot of day rooms. I did murals from Mitchell Field, Long Island all the way to Okinawa, usually with a chaplain running right along behind me painting out, as fast as I could, and all sorts of interesting—very interesting—pictures on the prows of airplanes but none of the ones that ever got illustrated in LIFE magazine.

Actually, it was while I was in the War that I finally decided that I would really go in for commercial art as a profession and try to make something out of it.

I went primarily for advertising (in Pittsburgh and New York), with the objective, eventually, of becoming a Science Fiction illustrator.

FRASER: How do you translate the ideas of Science Fiction into believable paintings?

FREAS: It's a little difficult to express in a way that can communicate practically. Because for Science Fiction you are dealing with a situation which is impossible for anyone to see. None of us is ever going to live long enough to see something like these things happen! But, at the same time, I, as an illustrator, have to make it real to you. Because if I don't make it real to you in the picture, there is nothing that the author can say that is going to counteract it.

This is one of my big gripes with the upcoming generation of illustrators. They don't understand the necessity for creating the sense of acceptance before the reader ever gets to the story. If the reader could get to the story and then go to the picture, you wouldn't have to give him any accurate detail. You wouldn't have to convince him of anything because he's already bought it. You could give him the loosest sketch.

My problem is that none of the things that I am illustrating is my reader able to see. So I have to give it to him as a direct, personal, present-time experience. And the author picks up from there.

FRASER: Are there some conventions of the Science Fiction field and some symbols of SF art that the reader is familiar with which you can draw on—without making it cliché?

FREAS: Not very many. There's the Bug-Eyed Monster. There's the needle-shaped rocket.

All rockets are needle-shaped. Now, let's face it, we're going to have needle-shaped rocketships as long as we have people reading Science Fiction. Because the needle shape of the rocket has much less to do with the technological requirements of an Atlas or Saturn missile than it has with the psychological drive of the human mind.

It's not a Freudian symbol. It's not essentially a phallic symbol, although much has been written insisting it is. I don't disagree with the people who consider the Rocket a phallic symbol. I just say that they don't go far enough. They don't understand the importance of it. Because I can give you a rocket—and have—which is as female as you can get. And it's still a convincing rocket.

The point is that the rocket is the whole focus of our thrust outward, which is our whole vital force and it is much more than merely sexual. It's emotional, logical, I would even go so far as to say it's spiritual. You could do it with an arrow; you could do it with just a little pip; you can do it with a line. But the whole idea is the thrust outward.

We know we're on the way outward. This is—manifest destiny may be a dirty word but this is—Mankind's Manifest Destiny. There is no place to go but out. And it is absolutely impossible for us to just sit here. The only thing that will keep us on this planet is a war of such magnitude that it destroys or eliminates the basic raw materials that we would require to get us into space. Then we will be planet-bound and then we will die, inevitably.

—G—

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Carl Sagan

NAMING OF THE SOLAR SYSTEM

It would be charming to name craters on, say, Mercury after birds or butterflies. . .

THERE IS on the Moon a small impact crater called Galileo. It is about nine miles across, roughly the size of the greater Elizabeth, New Jersey Metropolitan area, and is so small that a fair-sized telescope is required to see it at all. Near the center of that side of the Moon which is perpetually turned towards the Earth is a prominent and splendid crater 90 miles across, called Ptolemy; it is easily seen with an inexpensive set of field glasses and can even be made out by persons of keen eyesight, with the naked eye. But Ptolemy (2nd Century, A.D.) was the principal advocate of the view that our planet is immovable and at the center of the universe; he imagined the Sun and the planets to circle the Earth once daily, imbedded in swift crystalline spheres. Galileo (1564-1642), on the other hand, was a leading supporter of the Copernican view that it is the Sun which is at the center of the solar system and that the Earth is one of many planets revolving around it. Moreover, it was Galileo who, by ob-

FROM THE MURMURS OF EARTH, by Carl Sagan, Random House, New York, in press. Portions of this article have appeared in the NEW YORK TIMES Magazine Section.

16 GALILEO



Photo credit: NASA

serving the crescent phase of Venus, provided the first convincing observational evidence in favor of the Copernican view. It was Galileo who made the first telescopic observations of the Moon. It was Galileo who first called attention to the existence of craters on our natural satellite. Why, then, is crater Ptolemy so much more prominent on the Moon than crater Galileo?

The convention of naming lunar craters after people was first proposed by the Flemish mathematician Michael Florent van Langren. Employed by the Spanish crown, he suggested in 1645 naming the craters after Biblical personages. The first proposal on lunar nomenclature which was generally adopted was put forth by Johannes Hevelius, known by his Latinized name of Hevelius. A brewer and town politician in Danzig, Hevelius devoted a great deal of time to lunar cartography, publishing in 1647 a famous book, *Selenographia*. Having hand-engraved the copper plates used for printing his maps of the telescopic appearance of the Moon, Hevelius was faced with the question of what to name the features depicted. Hevelius felt that no logical connection existed between the features on the

Moon and the patriarchs and prophets of thousands of years earlier; and was also concerned that there might be substantial controversy about which philosophers and scientists—particularly if still living—to thus honor. Taking a more prudent course, he named the prominent lunar mountains, craters, plains, and valleys after comparable terrestrial features: as a result we have lunar Apennine, Pyrene, Caucasus, and Jura mountains, and even an Alpine valley, although some of these names were suggested, after Hevelius, by later astronomers.

Galileo's impression was that the dark, flat areas on the moon might be seas, real watery oceans—and that the bright and rougher regions densely studded with craters were continents. Thus, there is on the Moon, as on the Earth, a Mare Serenitatis (Pacific Ocean), following Hevelius' convention of names by terrestrial analogy. But the other maria (plural for the Latin *mare*, sea) were later named primarily after states of mind or conditions of nature; thus: Mare Frigoris, the sea of cold; Lacus Somniorum, the lake of dreams; Mare Crisium, the sea of crises; Sinus Iridum, the bay of rainbows; Mare

Naming of the Solar System

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Serenitatis, the sea of serenity; Oceanus Procellarum, the ocean of storms; Mare Nubium, the sea of clouds; Mare Fecunditatis, the sea of fertility; Sinus Aestuum, the seething bay; Mare Imbrium, the sea of rains; and Mare Tranquillitatis, the sea of tranquility—a poetic and evocative collection of place names, particularly for so inhospitable an environment as the Moon. Unfortunately, the lunar maria are bone dry and samples returned from them by the U.S. *Apollo* and Soviet *Luna* missions imply that never in their past were they filled with water. These names also have survived to the present. The first spacecraft to return data from the surface of the Moon, *Luna 2*, touched down in Mare Imbrium; and the first human beings to make landfall on our natural satellite, the astronauts of *Apollo 11*, did so, ten years later, in Mare Tranquillitatis. I think Galileo would have been surprised and pleased.

Despite Hevelius' misgivings, the lunar craters were named after scientists and philosophers, in a 1651 publication, *Almagestum Novum*, by Giovanni Battista Riccioli. The title of the book means "The New Almagest," the old Almagest having been the life's work of Ptolemy. ("Almagest," a modest title, means in Arabic "The Greatest.") Riccioli, a Jesuit anti-Copernican, simply published a map on which he placed his personal preferences for crater names, and the precedent has been followed without question ever since. Riccioli's book was published nine years after the death of Galileo, and there has certainly been adequate opportunity to rename craters later. The crater Galileo did not even receive its present name until 1834. Astronomers have accepted this embarrassingly ungenerous recognition of Galileo. Twice as large as crater Galileo is one called Hell, after the Jesuit Maximilian Hell. One of the most striking of the lunar craters is Clavius, 142 miles in diameter and the site of a fictional lunar base in the movie *2001: A Space Odyssey*. Clavius is the Latinized name of Cristoffel Schlüssel ("key"=clavius), another member of the Jesuit order and a supporter of Ptolemy. Galileo engaged in a protracted controversy on the priority of discovery and the nature of sunspots with yet another Jesuit priest, Christopher Scheiner, which developed into a bitter personal conflict and which is thought by many historians of science to have contributed to the house arrest of Galileo; the pro-

scription of his books; and his confession, extracted under threat of torture by the Inquisition, that his previous Copernican writings were heretical and that the Earth did not move. Scheiner is commemorated by a lunar crater 70 miles across. And Hevelius, who objected altogether to the naming of lunar features after people, has a handsome crater named after him.

Riccioli gave the names Tycho, Kepler and, to his credit, Copernicus to three of the most prominent craters on the near side of the Moon. Riccioli himself and his student Grimaldi received large craters at the limb or edge of the Moon, Riccioli's being 106 miles across. Another prominent crater is named Alphonsus after Alfonso X of Castile, a thirteenth century Spanish monarch who had commented, after witnessing the complexity of the Ptolemaic system, that had he been present at the Creation he could have given God some useful suggestions on ordering the universe. (It is amusing to imagine Alfonso X's response were he to learn that seven hundred years later a nation across the Western ocean would send an engine called *Ranger 9* to the Moon, automatically producing images of the lunar surface as it descended, until finally it crashed in a pre-existing depression named, after his Castilian majesty, Alphonsus.) A somewhat less prominent crater is named after Fabricius, the Latinized name of David Goldschmidt, who in 1596 discovered that the star Mira varied periodically in brightness, striking another blow against the view championed by Aristotle and supported by the Church that the heavens were unchanging. Thus the prejudice against Galileo in seventeenth century Italy did not, in the naming of lunar features, carry over as a completely consistent bias in favor of Church fathers and Church doctrines on matters astronomical.

Of the approximately 7,000 named lunar formations on the Earth-facing hemisphere, it is difficult to extract from crater sizes any consistent pattern. There are craters named after political figures who had far less influence on astronomy than Galileo, such as Julius Caesar and Wilhelm I; and after individuals of heroic obscurity: for example, crater Wurzelbauer (50 miles in diameter) and crater Billy (31 miles in diameter).^{*} Most of the designations of small lunar craters are derivative from large and nearby craters. For example,

near the crater Moesting are the smaller craters Moesting A, Moesting B, Moesting C and so on. A wise prohibition against naming craters after living individuals has been breached only occasionally, as in assigning a few quite small craters to American astronauts of the *Apollo* Lunar missions; and, by a curious symmetry in the age of detente, to Soviet cosmonauts who remained behind in Earth orbit.

In this century an attempt has been made to name, consistently and coherently, surface features and other celestial objects by giving this function to special commissions of the International Astronomical Union (IAU), the organization of all professional astronomers on the planet Earth. A previously unnamed bay of one of the lunar "seas," examined in detail by the American *Ranger* spacecraft, was officially designated Mare Cognitum—the known sea. It is a name not so much of quiet satisfaction as of jubilation. IAU deliberations have not always been easy. For example, when the first—some what indistinct—photographs of the far side of the Moon were returned by the historically important *Luna 3* mission, the Soviet discoverers wished to name a long, bright marking on their photographs "The Soviet Mountains." Since there is no major terrestrial mountain range of this name, the suggestion was in conflict with the Hevelius convention. It was accepted, nevertheless, in homage to the remarkable feat of *Luna 3*. Unfortunately, subsequent data prove that the Soviet Mountains are not mountains at all, and the name has been rescinded. In a related instance Soviet delegates proposed naming one of the two maria on the lunar far side (both very small compared with those on the near side) Mare Moscovense, the sea of Moscow. But, it was objected by Western astronomers, this again departed from tradition because Moscow was neither a state of nature nor a state of mind. It was pointed out in response

^{*}Riccioli's list of names included, however, only individuals who made some contribution to astronomy. Julius Caesar instituted the Julian calendar; Wilhelm IV, Landgrave of Hesse, studied comets and made contributions to the determination of the positions of stars; Wurzelbauer made systematic observations of the Sun and eclipses; and Billy was the first to argue that comets do not move in straight lines. He also countered the view that comets were omens of evil and published a book opposing astrological superstition.

that the most recent namings of lunar maria—those on the edges or limbs of the Moon, which are difficult to make out with ground-based telescopes—have not quite followed this convention either: as Mare Marginis (Marginal Sea), Mare Orientale (Eastern Sea), and Mare Smythii (Smyth Sea). Perfect consistency having already been breached, the issue was decided in favor of the Soviet proposal. At an International Astronomical Union meeting at Berkeley, California in 1961, it was officially ruled by Audouin Dollfus of France that Moscow is a state of mind.

The advent of space exploration has now multiplied manyfold the problems of solar system nomenclature. An interesting example of the emerging trend can be found in the naming of features on Mars. Bright and dark surface markings on the red planet have been viewed, recorded and mapped from Earth for several centuries. While the nature of the markings was unknown it was an irresistible temptation to name them nevertheless. Following several abortive attempts to name these Martian features after astronomers who had studied Mars, G. V. Schiaparelli in Italy and E. M. Antoniadi, a Greek astronomer who worked in France, established around the turn of the twentieth century the convention of naming Martian features after allusions to classical and mythological personages and place names. Thus there is on Mars Thoth-Nepenthes, Memnonia, Hesperia, Mare Boreum (the Northern Sea) and Mare Acidalium, as well as Utopia, Elysium, Atlantis, Lemuria, Eos (dawn) and Uchronia (which, I suppose, can be translated as good times). The American poet, Diane Ackerman, has written:

*Romantics, take heart:
You can breakfast
In Syria, lunch in Sinai,
Track the Nile
To its source (Nílokeras)
Before dinner, and there,
Making ablutions to Osiris,
Win a boon to Eden,
Where all four rivers
Of Paradise converge,
Then spend the night
In Pandora, or with Ulysses,
Proteus, or even Noah
In the land of gold (Cbrsey)
Or by the leak-green sea.
That madman Schiaparelli
Took one peek
At the Martian tabula rasa*

*And, daft with the sheer
Profusion of matter,
Went dub-wild...*

In 1890 scholarly people were much more comfortable with classical myth than they are today.

The kaleidoscopic surface of Mars has been revealed by American spacecraft of the *Mariner* and *Viking* series, but chiefly by *Mariner 9* which orbited Mars for a full year beginning in November, 1971 and radioed back to Earth more than 7,200 close-up photographs of its surface. A profusion of unexpected and exotic detail was uncovered, including towering volcanic mountains, craters of the lunar sort but much more heavily eroded, and enigmatic, sinuous valleys which probably were caused by running water at previous epochs in the history of the planet. These new features cried out for names and the IAU dutifully appointed a committee under the chairmanship of Gerard de Vaucouleurs of the University of Texas to propose a new Martian nomenclature. Through the efforts of several of us on the Martian nomenclature committee, a serious attempt was made to deprovincialize the new names. It was impossible to prevent major craters being named after astronomers who had studied Mars, but the range of occupations and nationalities could be significantly broadened. Thus, there are Martian craters larger than 60 miles across named after the Chinese astronomers Li Fan and Liu Hsin; after such biologists as Alfred Russel Wallace, Wolf Vishniac, S.N. Vinogradsky, L. Spallanzani, F. Redi, Louis Pasteur, H.J. Muller, T.H. Huxley, J.B.S. Haldane, and Charles Darwin; after a handful of geologists such as Louis Agassiz, Alfred Wegener, Charles Lyell, James Hutton and E. Suess (there is a Dr. Suess on Mars!); and even after a few science fiction writers such as Edgar Rice Burroughs, H.G. Wells, Stanley Weinbaum, and John W. Campbell, Jr., There are also two large craters on Mars named Schiaparelli and Antoniadi.

But there are many more cultures on the planet Earth—even ones with identifiable astronomical traditions—than are represented by any such list of individual names. In an attempt to offset, at least in part, this problem a suggestion of mine was accepted to name the sinuous valleys after the names of Mars in other, largely non-Indoeurope-

an, languages*. A table of the most prominent of these is attached. By a curious coincidence Ma'adim (Hebrew) and Al Qahira (Arabic: the war god after whom Cairo is named) are cheek by jowl. The prime landing site for the first Viking spacecraft which landed on Mars on July 20, 1976, is in Chryse, near the confluence of the Ares, Tiu, Simud, and Shalbatana valleys.

For the massive Martian volcanoes, one suggestion was to name them after major terrestrial volcanoes, such as Ngorongoro or Krakatoa, which would permit some appearance on Mars of cultures with no written astronomical tradition. But this was objected to on the ground that there would be a confusion when comparing terrestrial and Martian volcanoes: Which Ngorongoro are we talking about? The same potential problem exists for terrestrial cities, but we seem able to compare Portland, Oregon with Portland, Maine, without becoming hopelessly confused. Another suggestion, made by a European savant, was to name each volcano Mons (mountain) followed by the name of a principal Roman deity in the appropriate Latin genitive case: thus, Mons Martes, Mons Jovis and Mons Veneris. I objected that at least the last of these had been preempted by quite a different field of human activity. The reply was: "Oh, I hadn't heard." (The same response, incidentally, appears in Graham Greene's novel *The End of the Affair* when the hero remonstrates with a detective engaged to find evidence of infidelity for using the detective's son as a decoy. The son's name, it turns out, is Lance. When asked why he named the boy Lance, the detective replies that Sir Lancelot had found the Holy Grail. "That was Galahad," returns the hero, "Lancelot was found in bed with Queen Guinevere." "Oh," says the detective, "I hadn't heard.") The final outcome was to name the Martian volcanoes after adjacent bright and dark markings in the classical nomenclature. We have Pavonis Mons, Elysium Mons and—satisfyingly, for the largest volcano in the solar system—Olympus Mons. Thus, while the volcano names are very much in the Western tradition, by and large the most recent Mars nomenclature

*A colleague, noting that most contributions to the historical development of astronomy were made in the West writes, "Worst idea you ever had, Carl." But the names should be, I think, not just a reward for astronomical achievement, but also a reflection of how we wish our civilization to be remembered.



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represents a significant break with tradition: an important number of features have been named neither after evocations of classical times nor after European geographical features and nineteenth century Western visual astronomers.

Some Martian and lunar craters are named after the same individuals. This is the Portland case again and I think it will in practice cause very little confusion. It does, however, have at least one salutary benefit: On Mars there is today a large crater named Galileo. It is about the same size as one named Ptolemy. And there are on Mars no craters named Scheiner or Riccioli.

Another unexpected consequence of the *Mariner 9* mission is that the first close-up photographs of the moons of another planet were obtained. Maps now exist which show about half the surface features on the two Martian moons, Phobos and Deimos (Greek for fear and terror, the attendants of the war god, Mars). A subcommittee on Mars satellite nomenclature which I chaired assigned craters on Phobos to astronomers who had studied the moons. A prominent crater at Phobos's south pole is named after Asaph Hall, the discoverer of both moons. Astronomical apocrypha have it that Hall was on the verge of giving up his search for the Martian moons when he was directed by his wife to return to the telescope. He promptly discovered them and named them fear and terror. Accordingly, the largest crater on Phobos is given Mrs. Hall's maiden name, Angelina Stickney. Had the impacting object which excavated crater Stickney been any larger, it probably would have shattered Phobos.

Deimos is reserved for writers and others who were in some way involved with speculations about the moons of Mars. The two most prominent features are named after Jonathan Swift and Voltaire who, in their speculative romances, *Gulliver's Travels* and *Micromegas* respectively, imagined, before their actual discovery, the existence of two moons around Mars. I wanted to name a third Demonic crater after Rene Magritte, the Belgian surrealist whose paintings *Le Chateau de Pyrenees* and *Le Sens de Realite* pictured large rocks, suspended in the sky, of an aspect astonishingly like the two Martian moons—except for the presence in the first painting of a castle which,

so far as we know, does not surmount Phobos. The suggestion was, however, voted down as frivolous.

We live in a time, largely unrecognized, of high scientific adventure and unparalleled discovery. This is the moment in history when the features on the planets will be named forever. A crater name represents a substantial memorial: the estimated lifetime of large lunar, Martian and Mercurian craters is measured in billions of years. Because of the enormous recent increase in the number of surface features which need to be named—and also because almost all dead astronomers have already been placed on one or another celestial object—a new approach to planetary nomenclature is needed. At the International Astronomical Union meeting in Sydney, Australia in 1973, several committees were appointed to look into questions of planetary nomenclature under the overall chairmanship of Peter Millman of the National Research Council of Canada. The initial thinking of these groups has now been reported briefly in astronomical publications and in the press. One clear problem is that if craters on other planets are now named after a category other than people we will be left with only the names of astronomers and a few others on the Moon and planets. It would be charming to name craters on, say, Mercury, after birds or butterflies, or cities or ancient vehicles of exploration and discovery. But if we accept this course we will leave the impression on globes and maps and textbooks that we esteem only astronomers and physicists; that we care nothing for poets, composers, painters, historians, archaeologists, playwrights, mathematicians, anthropologists, sculptors, physicians, psychologists, novelists, molecular biologists, engineers, and linguists. The proposal that such individuals be commemorated with unassigned lunar craters would result, say, in Dostoevsky or Mozart or Hiroshige assigned craters a tenth of a mile across, while Pitiscus is 52 miles in diameter. I do not think this would speak well for the breadth of vision and intellectual ecumenicism of the name-givers.

After a protracted debate this point of view seems to have prevailed—in significant part due to its vigorous support by Soviet astronomers. Accordingly, the Mercury nomenclature

committee, under the chairmanship of David Morrison of the University of Hawaii, has decided to name Mercurian impact craters after composers, poets, and authors. Thus, major craters will be named Johann Sebastian Bach, Homer, and Murasaki. It is difficult for a committee of largely Western astronomers to select a group of names representative of all world culture, and Morrison's committee has requested help from appropriate musicians and experts in comparative literature. The most vexing problem is to find, for example, the names of those who composed Han dynasty music, cast Benin bronzes, carved Kwakiutl totem poles, and compiled Melanesian folk epics. But even if such information comes in slowly there will be time: The *Mariner 10* photography of Mercury, which uncovered the features of Mercury to be named, covered only half the surface of the planet. It will be many years before the craters in the other hemisphere will be photographed and named. In addition there are a few objects on Mercury which have been recommended for other sorts of names for special purposes. The proposed 20° meridian of longitude passes through a small crater which the *Mariner 10* television experimenters have suggested calling Hun Kal, the Aztec word for twenty, the base of Aztec arithmetic. And they have suggested calling an enormous depression, in some senses comparable to a lunar mare, the Caloris basin: Mercury is very hot. Finally, all of these names apply only to the topographic features of Mercury; the bright and dark markings, glimpsed dimly by past generations of ground-based astronomers have not yet been mapped reliably. When they are there will probably be new suggestions for naming them. Antoniadi proposed names for such features on Mercury, some of which—such as Solitudo Hermae Trismegisti—have a fine ring and perhaps ultimately will be retained.

No photographic maps of the surface of Venus exist, because the planet is perpetually enshrouded by opaque clouds of concentrated sulfuric acid. Nevertheless, surface features are even now being mapped by ground-based radar. In another few years we may have, through observations at Cornell University's Arecibo Observatory, in Puerto Rico, complete radar maps of Venus down to fea-

Naming of the Solar System

tures a few miles across. Already it is apparent that there are craters and mountains, and other topographical features of stranger aspect. The success of the *Venera 9* and *10* spacecraft in obtaining photographs from the surface of Venus suggests that someday photographs may be returned from aircraft or balloons in the lower Venus atmosphere. The first prominent features discovered on Venus, regions highly reflective to radar, were given unassuming names such as Alpha, Beta, and Gamma. The Venus nomenclature committee, under the chairmanship of Gordon Pettengill of the Massachusetts Institute of Technology, proposed two categories of names for Venus surface features. One category would be pioneers in radio technology, whose work led to the development of the radar techniques which permit mapping the surface of Venus: for example, Faraday, Maxwell, Hertz, Benjamin Franklin, and Marconi. The other category, suggested by the name of the planet itself, would be women. At first glance the idea of a planet devoted to women may appear sexist. But I think the opposite is true. For historical reasons women have been discouraged from pursuing the sorts

of occupations which are now being memorialized on other planets. The number of women after whom craters have so far been named is very small: Sklodowska (Madame Curie's maiden name), Stickney, the astronomer Maria Mitchell, the pioneer nuclear physicist Lisa Meitner, Lady Murasaki, and a very few others. While by the occupational rules for other planets women's names will continue to appear occasionally on other planetary surfaces, the Venus proposal is the only one which permits adequate recognition to be made of the historical contribution of women. (I am glad, however, that this idea will not be applied consistently; I would not myself want to see Mercury covered with businessmen and Mars with generals.)

In a fashion, women have traditionally been commemorated in the asteroid belt, that collection of rocky and metallic boulders which circle the sun between the orbits of Mars and Jupiter. With the exception of a category of asteroids named after heroes of the Trojan War, it used to be that all asteroids were named after women. First it was largely women of classical mythology, such as Ceres, Urania,

Circé, and Pandora. As available goddesses dwindled, the scope broadened, as Sappho, Dike, Virginia, and Sylvia. Then, as the floodgates of discovery opened and all names of astronomers' wives, mothers, sisters, mistresses, and great-aunts were exhausted, they took to naming asteroids after real or hoped-for patrons and others, with a female ending appended: as, for example, Rockefellera. By now there are more than 1,900 asteroids discovered and the situation has become moderately desperate. But non-Western traditions hardly have been tapped, and there are a multitude of Basque, Amharic, Ainu, Dobu, and I Kung feminine names for future asteroids. An additional problem—or opportunity depending on how one views it—is that we may soon obtain close-up photographs of asteroids. For example, the *Mariner Jupiter/Saturn* mission, designed to be launched towards those planets in 1977, might pass close to an asteroid. (In one early mission design, the spacecraft would have passed by Undina which is more than a hundred miles across. Like Phobos and Deimos, Undina and the other asteroids must have surface details which will cry out to be named.)

Beyond the asteroid belt, on the

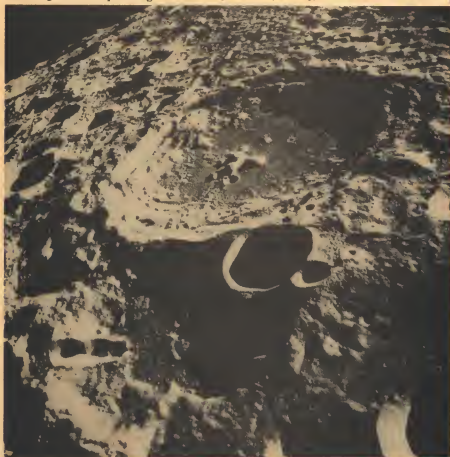


Photo credit: NASA

Carl Sagan

There are probably more professional astronomers alive today than in the total prior recorded history of mankind.

planets and large moons of the outer solar system, there are no nondescriptive names which have been so far bestowed. Jupiter, for example, has a Great Red Spot and a North Equatorial Belt, but no feature called, say, Smedley. The reason is that when we see Jupiter we are looking at its clouds, and it would not be a very fitting or at least not a very long-lived memorial to Smedley to name a cloud after him. Instead, the present major question on nomenclature in the outer solar system is what to name the moons of Jupiter. The moons of Saturn, Uranus, and Neptune have satisfying or at least obscure classical names (see Table 2). But the situation for the 14 moons of Jupiter is different.

The four large moons of Jupiter were discovered by Galileo. Like the German philosopher Hegel—who predicted on philosophical grounds that no new planets existed, one year before the discovery of Ceres—Galileo's theological contemporaries were convinced by a vague amalgam of Aristotelean and biblical ideas that the other planets could have no moons. The contrary discovery by Galileo was disconcerting to fundamentalist churchmen of the time. Possibly in an effort to circumvent criticism, Galileo called the Jovian moons the Medician satellites—after his funding agency. But posterity has been wiser: they are known instead as the Galilean satellites. In a similar vein, when William Herschel discovered the seventh planet he proposed calling it "George."⁹ If wiser heads had not prevailed, we might today, past the Bicentennial of the American Revolution, have a major planet named after George III. Instead we call it Uranus.

The Galilean satellites were named by Simon Marius, (commemorated on the Moon by a crater 27 miles across), a contemporary of Galileo and a disputant with him for the priority of their discovery. Marius and Johannes Kepler felt that it would be extremely unwise to name celestial objects after real people and particularly after political personages. Marius wrote: "I want the thing done without superstition and with the sanction of theologians. Jupiter especially is charged by the poets with illicit loves. Especially well-known among these are three virgins, whose love Jupiter secretly coveted and obtained, namely: Io,...Callisto,...and

Europa...Yet even more ardently did he love the beautiful boy Ganymede... and so I believe that I have not done badly in naming the first Io, the second Europa, the third, on account of the splendor of its light, Ganymede, and lastly the fourth Callisto."

However, in 1892 E. E. Barnard discovered a fifth moon of Jupiter with an orbit interior to Io's. Barnard resolutely insisted that this satellite should be called Jupiter 5 and by no other name. (He understandably resisted calling it Jupiter 0.) Since then, Barnard's position has been maintained and of the 14 Jovian moons now known, only the Galilean satellites have names officially sanctioned by the IAU. However unreasonable it may be, people show a strong preference for names over numbers. This is clearly illustrated in the resistance of college students to being considered "only a number" by the college bursar; to the outrage of many citizens at being known to the Government only by their social security number; and by the systematic attempts in jails and prison camps to demoralize and degrade the inmates by assigning them a numeral as their only identity. Soon after Barnard's discovery, Camille Flammarion suggested the name Amalthea for Jupiter 5; Amalthea was in Greek legend the goat which suckled the infant Zeus. While being suckled by a goat is not precisely an act of illicit love, it must have seemed, to the Gallic astronomer, sufficiently close.

The IAU Commission on Jovian nomenclature, chaired by Tobias Owen of the State University of New York at Stony Brook, has proposed a set of names for Jupiter 6 through 13 as shown in the accompanying table. Two principles guided their selection: the name chosen should be "an illicit love" of Jupiter, but one so obscure as to have been missed by those indefatigable cullers of classical names who name asteroids; and must end with an "a" or an "e" depending on whether the moon goes around Jupiter clockwise or counterclockwise. But in the opinions of at least some classical scholars these names are obscure to the point of bewilderment, and the result leaves many of the most prominent Jovian paramours unrepresented in the Jupiter system. The result is particularly poignant in that Hera (Juno), the wife so often scorned by Zeus (Jupiter), is not represented at all. An alternative list of names, which includes most of the

prominent paramours as well as Hera, is also shown in the accompanying table. Were these names employed it is true they would duplicate some asteroid names. This is in any case already a fact for the four Galilean satellites, where the amount of confusion thus engendered has been negligible. I live in the city of Ithaca, New York. Yet, when I read the *Odyssey*, I am rarely confused about which city Ulysses is wandering towards. On the other hand, there are those who support Barnard's position that numbers are sufficient; prominent among these is Charles Kowal of the California Institute of Technology—the discoverer of Jupiter 13 and Jupiter 14. There seems to be merit in all three positions and it will be interesting to see how this debate turns out. At least we do not yet have to judge the merits of contending suggestions for naming features on the Jovian satellites.

But that time is not long off. There are 31 known moons of Jupiter, Saturn, Uranus and Neptune. None has been photographed close-up. However, in 1979-1981, the *Mariner Jupiter/Saturn* mission will obtain high resolution images of about ten of them, in addition to the rings of Saturn. No one knows what naming conventions will then be adopted. The total surface area of the small objects in the outer solar system greatly exceeds the areas of Mercury, Venus, Earth, Moon, Mars, Phobos and Deimos together. There will be ample opportunity for all human occupations and cultures to be represented eventually; and I daresay provisions for non-human species can also be made. There are probably more professional astronomers alive today than in the total prior recorded history of mankind. I suppose that many of us will also be commemorated in the outer solar system—a crater on Callisto, a volcano on Titan, a ridge on Miranda, a glacier on Halley's comet (Comets, incidentally, are given the names of their discoverers). I sometimes wonder what the arrangement will be, whether those who are bitter rivals will be separated by placing them on different worlds; and whether those whose discoveries were collaborative will nestle together, crater rampart to crater rampart. There have been objections that political philosophers are too controversial. I myself would be delighted to see two enormous and adjacent craters called Adam Smith and Karl Marx. There are even enough objects in the

⁹More precisely, "Georgium Sidus," George's star.

solar system that dead political and military leaders can probably be accommodated. There are those who have advocated supporting astronomy by selling crater names to the highest bidder, but I think this may go too far.

There is a curious problem about names in the outer solar system. Many of the objects there have extremely low density, as if they are made of ice, great fluffy snowballs tens or hundreds of miles across. While objects impacting these bodies will certainly produce craters, craters in ice will not last very long. At least for some objects in the outer solar system, named features may be transient. Perhaps that is a good thing: it would give us a chance to revise our opinions of politicians and others; and will give eventual recourse if flushes of national or ideological fervor are reflected in solar system nomenclature. The history of astronomy shows that some suggestions for celestial nomenclature are better ignored. For example, in 1688 Erhard Weigel at Jena proposed a revision of the ordinary zodiacal constellations—the lions, virgins, fish and water carriers that people have in mind when they ask you what “sign” you are. Weigel proposed instead a “heraldic sky,” in which the royal families of Europe would be represented by their tutelary animals: a lion and a unicorn for England, for example. I hate to imagine descriptive stellar astronomy today had that idea been adopted in the seventeenth century. The sky would be carved into two hundred tiny patches, one for each present nation-state.

The naming of the solar system is fundamentally not a task for the exact sciences. It has historically encountered prejudice and jingoism and lack of foresight at every turn. However, while it may be a little early for self-congratulation, I think astronomers have recently made very major steps to de-provincialize the nomenclature, and make it representative of all of humankind.

There are some who think it is a pointless, or at least thankless, task. But some of us are convinced it is important. The placenames assigned are likely to apply for a very long time. And our remote descendants will be using our nomenclature for their homes: on the broiling surface of Mercury; by the banks of the Martian valleys; on the slopes of Titanian volcanoes; or on the frozen landscape of

distant Pluto, where the sun appears as a point of bright light in a sky of unremitting blackness. Their view of us, of what we cherish and hold dear, may be determined largely by how today we name the moons and planets.

TABLE 1: MARTIAN CHANNELS

NAME	LANGUAGE
Al Qahira	Egyptian Arabic
Ares	Greek
Auqakuh	Quechua (Inca)
Huo Hsing	Chinese
Ma'adim	Hebrew
Mangala	Sanskrit
Nirgal	Babylonian
Kasei	Japanese
Shalbatana	Akkadian
Simud	Sumerian
Tiu	Old English

TABLE 2

SATELLITE NAMES OF THE OUTER PLANETS

SATURN	URANUS
Janus	Miranda
Mimas	Ariel
Enceladus	Umbriel
Tethys	Titania
Titan	Oberon
Hyperion	
Iapetus	NEPTUNE
Phoebe	Triton
Dione	Nereid
Rhea	
PLUTO	
None known	

TABLE 3: PROPOSED NAMES FOR JOVIAN SATELLITES

Satellite	Proposed I.A.U. Committee Name	Alternative Name Suggested Here
V	Amalthea	Amalthea
VI	Himalia	Maia
VII	Elara	Hera
VIII	Pasiphae	Alcmene
IX	Sinope	Leto
X	Lysitha	Demeter
XI	Carme	Semele
XII	Anake	Danae
XIII	Leda	Leda
XIV	—	—

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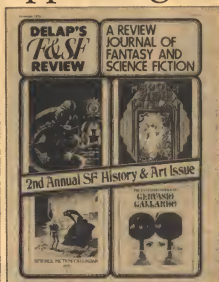
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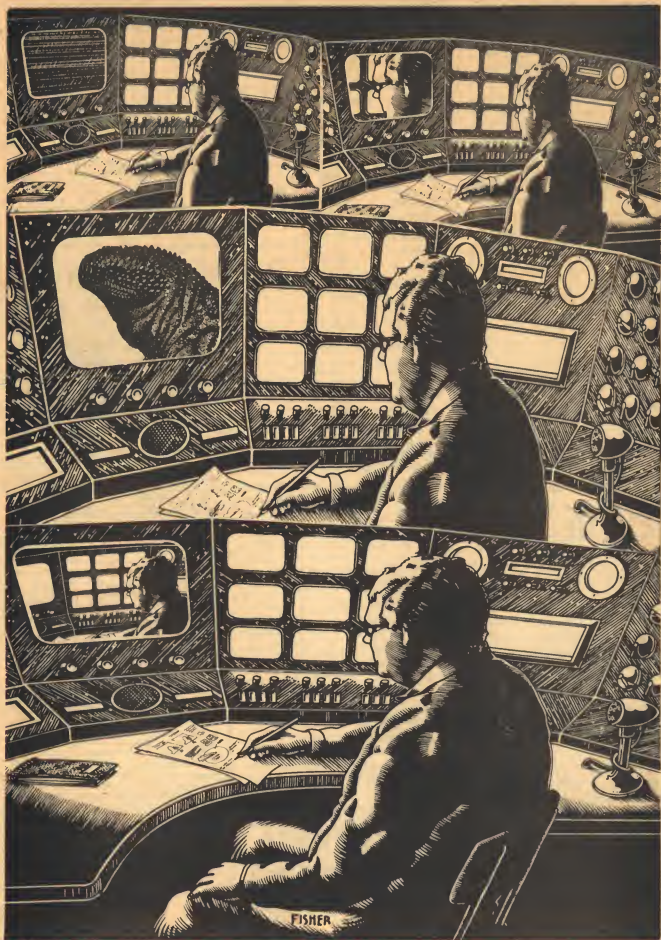
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Brian W. Aldiss

WHERE THE LINES CONVERGE

When he had few thoughts to express, Felix uttered them aloud and the house swallowed them as a whale swallows plankton.

Brian W. Aldiss

ANNA MACGUIRE drove to see her father whenever she could. The opportunities grew fewer and fewer, although she knew he needed help. She said to herself, "I go as often as I can because I love him as much as I am capable of doing, given the limitations of my nature. Since those limitations were to large extent fixed by the dreadful way he and my mother brought me up, then he has only himself to blame if I do not turn up as often as he would like."

She had another excuse ready to explain why she went to Crackmore less often than formerly. Since the new airport had been built, Crackmore had become extremely difficult to reach. The old main road, the A394, had been severed. It ended at Ashmansford now, and a lengthy detour was needed, meandering through all the lesser roads skirting the west side of the airport. True, a new spur had been added between Packton and Bucklers Wick, but that was only useful for traffic approaching from the west. Then again, the fast new airport road ran really in the wrong direction. Anna had used it once, driving right into the airport and out again at the north side; but she had lost her direction and was forced to make a detour through Plough and North Baldick.

She had said to her boyfriend, as she called him, in one of her small flat jokes, "It's all sort of symbolic of the way old people are cut off. Every time you improve a means of transport—i.e., build a new airport—you lose a generation. I'm sure Pop sees it that way."

She actually said "i.e.," as Trevor reported to his buddies in the office the next day. That was a Friday. By then, Anna, having scrounged a day off from the lab, was turning off just north of Ashmansworth, watching anxiously for the sign to Watermere.

FELIX MACGUIRE was due to retire from King Aviation Systems when the plan for the new airport was passed officially. Judy had been alive then.

"We'll be able to flog this property for twice what it's worth," he said. "How'd you like to go and live in the Algarve, my love?"

"I'm getting too old for change," she said.

"We could swim nine months of the year."

"I'm too old to get into a swimsuit," she said.

He smiled at her then, as part of the plan he had carried out tenaciously for over thirty years to keep her as happy as possible, for his own sake, and said gallantly, "I'd rather see you swimming in the nude."

Eventually, the representative of a firm of land-developers came and made an offer for Macguire's house and gardens. The offer was disappointingly small.

Felix and Judy hung on for a bigger offer. "We'll force them to improve their bid," he said. "We can wait as well as they can."

They waited. They were only on the margins of the new development. A new offer never came. Felix wrote and accepted the old offer. The firm wrote back five weeks later (addressing the letter to P. McGuire) to say there was no longer any necessity to purchase the property referred to. Judy died before the first runway was completed.

The barriers of the airport came swinging along, mile after mile of green-plastic-clad chain-link unrolling, munched off the road that passed Macguire's drive, and strode over the ditch that drained his pathetic little piece of

GALILEO 25

orchard. There was one house still occupied next to Macguire's, owned by a pleasant retired art-auctioneer called Standish who kept three Airedales. He had misplayed his hand much as Felix had, and was stuck with deteriorating property. On the evening of the day that the fence went by his land, secured by an enormous roaring machine that spat ten-foot concrete fence posts into the ground at five metre intervals, Standish shot his dogs, poured petrol all over the ground floor of his house, lit it, ran upstairs to his bedroom, sat himself down at a desk before a faded portrait of himself as a little boy, and blew his brains out. Felix heard the shots, even above the roar of a SST coming in.

From then on, he let weeds grow in his garden and the beeches become shaggier in the drive. He stayed indoors, concentrating on developing an advanced system of vision screens he called the Omniviewer, and thinking about the growing inhumanity of man.

OH, PISSI!" said Anna. She steered the Triumph into the side of the road and pulled the map over to her. She had gone wrong somewhere. She didn't recognize this stretch of road at all. She should have been through Wainsley by now. The map remained inscrutable.

She climbed out and stood in the road. There was no traffic. Anonymous countryside all round. Being a townswoman, she could not tell whether or not the fields were properly tended. The only landmark was an old railway station down a lane, its ruined roof showing across the nearest field. No rails served this monument to an obsolete transport system. Huge elms choked by ivy stood everywhere; she watched a transport plane appear to blunder between them like a huge moth.

A man stood in front of her. He might have materialized out of the ground. She thought immediately, "It's true, I wouldn't mind being raped, if we could go somewhere comfortable, but he might have all sorts of horrible diseases. And he might strangle me when he'd finished."

But the man simply said, "You aren't going to Casterham, are you?"

"No, I don't think so. I want to go to Crackmore. Do you know if I'm going the right way?"

He'd never heard of Crackmore. But he set her right for Wainsley, and she drove on again. At the last moment, she offered him a lift, but he refused; he wasn't going to be led on.

"I'm so isolated," she said aloud, "so isolated," as she drove.

But she had to admit to herself that it was a half-hearted protest; after all, she could always have asked the man if she wanted it that badly. People did, these days.

THE SELF-FOCUSING CAMERAS were his especial contribution. Light-and-motion-sensitive cells ensured that lenses focussed on him whenever he entered a room. Working slowly, spending a generous part of every day out in the workshop-laboratory next to the disused garage, Felix built himself a spy system, which would record any movements within the house.

When he had a few thoughts to express, Felix uttered them aloud and the house swallowed them as a whale swallows plankton — and would regurgitate them later on request.

"The Omniviewer is designed purely for self-observation; it is introspective. All other spy systems have been extrovert, designed to watch other people. Their purposes have generally been malign. The parallel with the human senses is striking. Human beings are generally motivated throughout life to watch others and not themselves, right from the early days in which they begin to learn by imitation and example. . . I must remind the grocer when he calls that that last lot of tinned meat gave me diarrhea."

Leaving the workshop, he went through the garage into the hall, which he crossed, and entered the living room. This he had bisected with partitioning some while ago, when he had been feeling his way towards a correct method of procedure for his experiments. It was in the far corner of the living room, the south-pointing corner of the house, that he had built his main control console. The workshop contained an auxiliary console.

From the main console, he could direct the movements of the nine cameras situated about the house, mainly on the ground floor. On monitor screens before him, he could keep zealous eye on most corners of the house — and above all on himself. Several times, he had detected movements that roused — indeed, confirmed — his suspicions, and of these he kept careful note, recording place, time, and appearance and gesture of the alien pseudo-appearance. 'Alien pseudo-appearance' was his first, half-joking, label for his early discoveries.

As usual, when he began work in the morning, he ran through a thorough check of all electronic equipment and sightings. That took him till noon. It was more than a check. It was a metaphysical exploration. It was a confirmation both of the existence of his world and of its threatened disintegration.

He switched the cameras on in turn, according to the numbered sequence he had given them, beginning with Number One. In this way, organisation was held at maximum. Not until much later in the morning would he get round to testing Camera Nine, perched outside on the chimney-stack of the house — none of the other cameras, except Five and Three, were situated for looking beyond the confining walls; that was not their province.

As Camera One briefly warmed, a scatter of geometrical patterns flashed like blueprints across the small monitor, grew, grew, burst, and were instantly gone. An unwavering picture snapped into being on the tiny screen.

This camera was located on its pivot in the wall behind Felix and some two feet above his head. As it was at present directed, beamed downwards and ahead (he carefully read off its three-dimensional positioning on a calibrated control globe), it showed the control console itself, with its switches and monitors, and Felix' right hand resting on the desk; the back of Felix' head was visible in one corner; so was the lower half of the partition, on which a giant viewing-screen had been erected. Also visible were the edge of the carpet, part of the wall, and a section of the window sill. The pattern on the monitor was a restful one of converging angles, relieved by the greater complexity covering about a third of the screen of the console.

Felix scrutinized the view in a leisurely and expert manner. In many ways, One always provided the most absorbing view, if not the most interesting perspectives.

After a thorough scrutiny, he switched on the large viewing-screen. Before viewing it directly, he watched it

WHERE THE LINES CONVERGE

light in the monitor-screen, via One.

The scatter of particles cleared and the tiny screen showed him the lower strip of the large screen, on which part of the console with the monitors was visible. On Number One of these tiny monitors, he could see the image of the lower strip of the large screen, with its line-up of monitors on the console. On the first of those monitors was a blur of light which the definition, however good, would not resolve into a clear image. Better lenses were probably the answer there, and he was working on that.

Satisfied at last with optical details, he set the camera controls to Slow Scan.

Camera One had a scan of two hundred and ten degrees laterally and little less in the vertical axis. Among the many pleasures of its field of vision — to be taken in due turn — was the view at 101.40N, 72.50W, which gave the corner of the room, where the southeast and southwest walls of the house met at the ceiling, as well as an oblique glimpse of the right-hand of the two windows in the front (southeast) wall. The merging and diverging lines were particularly significant, and there was the added pleasure of the paradox that although almost all the window could be seen, the view was so oblique that little could be observed beyond the window, except an insignificant stretch of weedy gravel; this seemed to reduce the window to a properly insignificant stature.

Also desirable, and considerably more complex, was the view at 10.00N, 47.56E. It gave one insignificant corner of the console, looking over it toward one of the two doors in the L-shaped room which led into the hall passage. Through this door, the camera took in a dark section of the passage, the doorway of the dining room beyond, and a segment of the dining room including a bit of the table with a chair pushed in to it (the dining room was never used), the carpet, a shadowy piece of ceiling, something of one of the two windows, and Camera Six, which stood on a bracket set in the wall at a height slightly less than that of One. 10.00N, 47.50E became even more engrossing when Six was functioning, since it then showed One in action; and, when One was in motion, its slight and delicate action was the only observable movement.

There were automatic as well as manual controls for each camera, so that 'favourite' or 'dangerous' or 'tranquil' views could be flicked over to at a moment's notice. There were also programmed automatics, by means of which the eight indoor cameras ran through a whole inter-related series of sightings of high complexity and enfiladed the entire volume of the house — for Felix had his moments of panic, when the idea that he had caught an unsuspecting movement, a figure all too like his own, would send his adrenalin count rocketing and his heart pounding, and he would snap into a survey of the whole territory. His recording system allowed him to play back and study any particular view at leisure.

Frequently, he saw shots which filled him with grave doubt, as he played them back and allowed his heart-rate to ease. Although no figures were revealed — his opponents were very clever — their presence was often implied by shadows, dark smudges, mingled fans of light and shade on carpet. They were there, right enough, meddling deliberately; and although no doubt some of the discrepancies in the visual record could be ascribed to aircraft passing low overhead, they were unwise to think he would always use

that excuse as a pretext for believing in their non-existence.

When he had thoroughly tested out Camera One through its entire sphere of scan, Felix left it running — and it would run now until he closed down after midnight — and switched on Camera Two.

Camera Number Two was on the far wall of the workshop. It had been the first of the series of cameras to be installed. It overlooked the length of the narrow workshop, including the screens of the auxiliary console, and the door at the far end, which always stood open (not only for security reasons but because the coaxial cable running to the rest of the house prevented its closure) to give a view into the garage, piled high with its old grocer's cartons and crates of tapex.

Although none of the cameras offered a very colourful scene, Two gave the grayest one. As, under Felix' control, it commenced its slow scan, it had nothing bright to show, although rolling towards the roof like an upturning eye, it picked up a patch of blue sky through the reinforced glass skylight.

When it lit obliquely on the three blown-up photographs on the inner wall, Felix slowed the motor until the view was almost steady and stared with satisfaction at the images of the photographs thrown on the big screen before him. There he saw three gigantic sea-going creatures, each remarkably similar to the next in its functional streamlined form. Something of his original thrill of horror and discovery came back to him as he looked.

He said aloud: "My evolutionary discovery is greater than Charles Darwin's, or his grandfather's, ... greater and far more world shaking. Darwin revealed only part of the truth, and that revelation has ever since concealed a far greater and more awesome truth. Do you hear me out there? I have the patience and courage of Charles Darwin. ... I too will wait for years if necessary, until I have incontrovertible proof of my theories."

Still staring at the images of the photographs, he switched to playback. He sat listening to his own voice, filtering softly through the house.

"—man beings are generally motivated throughout life to watch others and not themselves, right from the early days in which they begin to learn by imitation and example. ... I must remind the grocer when he calls that that last lot of tinned meat gave me diarrhoea. ... My evolutionary discovery is greater than Charles Darwin's. ..."

He heard himself out and then added, "The proof is mounting slowly."

He smiled at the pictures. They were more than a statement of faith; they were a defiance of the enemy. In truth, he inwardly cared little for his own bombast broadcast through the silent and possibly unoccupied rooms; yet it gave him a certain courage — and courage was needed at all times by all who moved towards the unknown — and of course it had a propaganda value. So he sat quietly, breathing regularly under his tattered sweater, as he watched the viewpoint of Two crawl lethargically past the marine shapes and up the formless areas of wall.

WHEN ANNA REACHED what was left of Crackmore, the morning was well advanced. She stopped the car at the filling station and got petrol. She had a headache and a sniffy nose. The pollen count was high, the midsummer heat closed about her

temples.

"Oh God, don't say I'm going to get one of my stream-cold! What a bore!"

With a feeling of oppression, she saw as she left the untidy station that the village had entered a phase of new and ugly growth. A big filling station was under construction not a hundred metres away from the one at which she had stopped. Next to it, a pokey estate of semi-detacheds was going up. A new road to the connecting road to the airport was being built, cutting through what was left of the old village. Although, admittedly, the old village was nothing to get excited about, at least it had preserved a sense of proportion, had been agreeably humble in scale. Now a gaunt supermarket was rising behind the old square, dwarfing the church. Everywhere was cluttered and uncomfortable. She was amazed — as so often before — at how many people showed a preference for an inhuman environment. As she drove by the road-making machines, a jet roared overhead, reminding her of her headache.

"Piss off!" she told it.

It was so senseless. There could now be nobody remaining in Crackmore who desired to live there. Most of them would be attached to the ground staff of the airport or something similar, and lived where they did purely for financial interest. Anyone with any spark of humanity in them had fled from the area long ago.

She turned off by the old war memorial ('Faithful Unto Death' 1914-1918, 1939-1945) and headed towards her father's house. The road shimmered in its own heat, creating imaginary pools and quagmires into which she drove.

Round the last corner, she passed the burnt-out shell of the Standish mansion. Burdock grew along its drive, rusty with July, and eager green things had sprung up round what was left of the structure. Sweet rocket flowered haphazardly. The shade under the high beeches behind was as dark as night. Ahead, lopping off the road, the airport fence. The fence put a terminator on everything — beyond was only the anticyclonic weather, breaking into slaty cumulus, which began to pile up the sky like out-of-hand elms, growing above low cloud and threatening a chance of thunder before the afternoon died.

The drive gates stood open. As the Triumph turned in, Anna saw that the drab green fence was closer to her father's house than she recalled. It was too long since she last visited Felix; her neglect of him was part of a greater neglect, of the wastage of everything.

On the other side of the fence, the road had been eradicated; machines had wiped it out of existence; on this side of the fence, nature was at work doing the same thing, throwing out an advance guard of wild grasses and buttercup, following up with nettles, dock, thistles, and brambles. Soon they would come sprawling their way along the road. It only needed a year or two, and they would be at the house.

Anna drew up before the front door, noting how the trees about the drive, beech and copper beech, had grown more ragged and encroached more since she was last here. She blew her nose before climbing out, not wishing her father to suspect she might have a cold developing.

The house had been solidly built just after the turn of the century, with gray slate roof and red brick, and a curious predilection for stone round the windows. It had

never been fashionable or imposing, though perhaps aiming at both; nevertheless, even in its old neglected age, it manifested something of the rather flashy solidity of the epoch in which it had been designed and constructed.

Before entering, Anna let a certain dread provoke her into stepping across the weedy gravel to peer through the living room windows. Through the second window, she saw her father crouched in his swivel chair, looking fixedly at something beyond the range of her vision. She stared at him as at a stranger. Felix Macguire was still a powerful man, the lines of his face were still commanding, while the recessing of his gums lent more emphasis than at any other stage in his life to a determined line of chin and jaw. His white hair, hanging forward over his brow, still contained something of the boisterousness she recalled in her childhood. All in all, he, like the house, had weathered well, retaining the same flashy solidity of the Edwardian Age.

Feeling guilty for spying on him, she turned away, thinking in a depressed way that her father seemed scarcely changed in appearance from when she could first remember him in childhood; yet she herself no longer had youthful expectations of life, and was moving towards middle age. With her habitual quick shift of thought, she ironically pronounced herself resigned to her own listless company.

She tried the handle of the front door. It opened. Hinges squeaked as she entered the hall.

Despite the heat outside, the feeling in the house was one of cold and damp; a comfortlessness less physical than an attribute of the phantoms haunting it. But the lengths of coaxial cable running boldly over the carpet or snaking up the stairs, the doors — to garage, lavatory, coat cupboard, and living room — wedged open, all contributed to the discomfort — not to mention the slow stare of Camera Four, situated knee-high on its bracket on the corner of the coat cupboard, where it could survey front door, hall, passage, and stairs.

"Are you there, father? It's me, Anna."

She went down the passage and through the second door of the living room. He had risen from the console and stood awaiting her. She went over to him and kissed him.

"How are you? You're looking well! Why didn't you write or send me a few words on a tape? I've been worried. I'm sorry it's been so long since my last visit, but we've been terribly busy at the labs — trade's bad, and that always seems to mean more work, for me at least. I had to go up to Newcastle with one of the partners last weekend or I would have come over then. Did you get my card, by the way? I'm sure I've sent you that view of the Civic Hall before, but it seemed to be the only view they had at the tobaccoconsists..."

She paused and her father said, "It's good of you to bother to come at all, Anna. I'll get you a cup of coffee, or something, shall I?"

"No, no, I'll get it. That's what I'm here for, isn't it? And may I open a window or two? It's terribly stuffy in here — it is July, you know, and you need some warm air circulating. And why don't you keep the front door locked when you are alone in the house? Suppose someone broke in?"

"If the front door is unlocked, I can get out quicker if I need to, can't I?"

They stared at each other. Anna dropped her gaze first.

"You aren't exactly welcoming, are you, father?"

"I said it was good of you to come. I'm pleased to see you. But it's no good complaining about the way I live directly you get in the house."

"I'm sorry, father, really. I didn't mean to nag, of course. Just a motherly instinct — you know what women are!" She put on a smile and moved to embrace him, then dumsly cut off the gesture. "Father, you're alone far too much. I know what you think about me, but you don't make it easy — you've never made it easy. Even when I was a little girl and I used to run to you—"

"You are grown up now, Anna!"

"Oh God, don't rub it in! You took care of that! What does being grown up mean but being even more isolated than as a child? What made you so inhuman, father? You never really loved me, did you? Why do you still expect me to come all this way up here to visit you, and it's terribly difficult to get here, just to make fun of me?"

"I don't expect you to visit me, Anna. You have to come now and then just to reproach me. You know very well that what you say hurts. You have in some way failed to achieve a mature personality and so you blame me for that. Perhaps I am to blame. But what use is blame? Was it worth coming this far just to deliver it?"

"Nothing's of any use to you, is it?" she said sulkily. "I'll go and make coffee, if there's any in the house."

Her father went back to sit down before his monitor screens. He switched Camera Eight on to the big screen and sat looking at an image of the inner wall of the second bedroom which included part of a wardrobe and, hanging from the picture rail, an engraving of Sir Edward Poynter's 'Faithful Unto Death', which had belonged to his mother.



In a minute, Anna poked her head round the door. "Coffee's ready! Come and have it in the kitchen — it's a bit fresher in here."

He went through and took the cup she offered him. Anna had opened the door to the side drive. Sunlight lay there in patches between trees.

"I'm pleased to see you have plenty of provisions in the house. At least you keep yourself fed properly. Prices of everything keep going up and up. I don't know where it will all end."

"I live very comfortably, Anna. I nourish myself, I exercise myself. I am entirely dedicated to my research and mean to keep myself as healthy as possible in order to pursue it. Did you manage to get that volume on convergence by Krost?"

"No, not yet. Foyle's had to order specially, and still it hasn't come through. Sorry. Everything takes so long. How's the research going?"

"Steadily."

"I know you aren't very keen to tell me about it, but you know I'm interested. Perhaps I could be of more help to you if you would tell me a bit more."

"My dear, I appreciate your interest, but I've told you before — the work has to be secret. I don't want it blabbed about and, in the sphere in which I'm working, you could not possibly be of any help."

"Ignoring the insulting suggestion that I should blab your secrets everywhere, couldn't I approach someone —"

"You know what I mean, you might tell one of your boy friends casually —" He paused, knowing he had said the wrong thing, blinked, and said hastily, "You shall have, perhaps, a small demonstration of what I'm doing. But I must keep it all secret. I'm on the brink of something extraordinary, that I know. . . one of those discoveries—revelations—that can completely overturn the thinking of all men, as Galileo did when he turned his telescope to the sky. There were telescopes, there was sky. But *he* was the man who had the original thought, *he* was the man who looked in a new direction. I am doing that. To you — though you may be my daughter — I'm just an old eccentric, spending his days staring at television screens. Aren't I, admit it? Well, that's much what they thought of Galileo. . . The name of Felix Macguire, my child. . . a few more years. . . I can't tell you. . ."

"Don't let your coffee get cold, father."

He turned his back to her and stared out of the door at the unkempt bushes.

"I understand, father. I mean, I understand your aspirations. Everyone has them. I know I have."

Her pathetic words, intended to contain a charge of reassurance through shared experience, died on her lips. In a more practical voice, she said, "All the same, it's not good for you to live here alone like this. I don't like it. It's a responsibility for me. I want you to come and live near me in Highgate where I can keep an eye on you. . . Or, if you won't do that, then I want a medical friend of mine to be allowed up here to see you. Robert Stokes-Wallis. He's a follower of Laing's. Perhaps you know his name."

She sniffed and blew her nose. Felix turned and watched her performance.

"I warn you, Anna, I want no interference with my routine. Tell your man to stay away. You think I'm cranky. Maybe I am. It's a cranky world. Whether I'm mad or not is

really a question of no importance beside the magnitude of the questions I am confronting. Now, let's say no more on that subject."

"Drink your coffee," she said pettishly. "And what's this demonstration you want to give me?"

Felix picked up the mug and sipped. "Are you, in fact, particularly interested?"

Making an effort, she laid a hand on the arm of his sweater. "I'm sure that you understand that I really am interested, father, and always have been, when allowed to be. I am really quite an intelligent and loving creature to my friends. So, of course, I am keen to see your demonstration."

"Good, good. You need only say yes — speeches aren't necessary. Now, I don't want you to be disappointed by the demonstration, because there is a danger it may seem very flat to you, you understand? Let me explain something about it first."

He pulled a book off the top of the refrigerator.

"Milton's poems. 'Paradise Lost'. I read it sometimes when I'm not working. A marvellous poem, although it contains a view of reality as a theological drama to which we no longer subscribe. When Milton was in Italy, he visited Galileo Galilei, and something of the astronomer's involvement with the heavens has got into the poem. Galileo is the greater man, because the scientist must take precedent over the poet; but either must have a measure of the other for real greatness."

"Father, you forget that you read me most of Book IV of 'Paradise Lost' last time I came up here. It is not my favourite poem."

"What seest thou else in the dark backward and abysm of time? Let me come to the point, which is not exactly Milton. We are talking about views of reality to which we no longer subscribe. The geocentric view of the universe prevailed for over a thousand years — needlessly, since a heliocentric view had been advanced before that. How can anything be correctly understood when such a great thing is misunderstood? It was not just a minor astronomical error — it was grounded in Man's erroneous view of his own importance in the universe."

"Nobody believes in the Ptolemaic geocentric view nowadays, and yet nevertheless thousands — millions of people have found a way of clinging to that ancient error by maintaining a belief in astrology: that the movements of remote suns can control a human destiny, or that, vice versa, human behaviour can provoke eclipses or similar signs of heavenly displeasure. Clear views of reality are at a premium. Indeed, I've come to believe something always distorts our vision. Bacon comes very close to the same conclusions in his 'Novum Organum'."

"Take mankind's idea of its own nature. In the west, the view prevailed until the Nineteenth Century that we were God's creatures, especially made to act in some obscure drama of His making. Your grandmother believed in the tale of Adam and Eve, and in every word of Genesis. She preferred that version of reality to Darwin's. Darwin showed that we were different from the animals only in degree and not in kind. But the opposite view had prevailed practically unchallenged for centuries, and men still prefer to behave as if they were apart from Nature. Not only is the truth hard to come by — it's often refused when available."

"I see that but, surely, in this century we have had our noses rubbed in reality uncomfortably enough."

"I don't think so, Anna. I believe we have escaped again. Look at the way in which the so-called side effects of technology are universally deplored. Everyone who pretends to any degree of civilization agrees to condemn nuclear warfare, the pollution of air, sea, and land, the sort of dreadful fate that has overtaken Crackmore, the hideous tide of automobiles which chokes our cities. Yet all these things are brought about by us. We have the power over technological and legislative processes to end all such abuses tomorrow if we wished. Instead, we continue to stock-pile nuclear weapons, we go on making thousands of automobiles per day, we continue to destroy every accessible environment. Why? Why? Because we wish it. Because we like it that way, because we crave disaster. That is the truth — that we think we feel otherwise is yet another proof of how incapable mankind is of coping with reality."

"Oh, but to argue like that — that's silly, father! After all, growing numbers of people —"

"I know what you are going to say —"

"Oh, no, you don't —"

"I know what you are going to say. You are going to say that there are increasing numbers of people who are showing by action that they hate what technology is doing to us. Perhaps. I do not suggest all men feel the same. Indeed, part of my thesis is that man is divided. But by and large there is a mass wish for catastrophe, hidden under mass delusion. So a considerable amount of my time here is devoted to bringing reality under better control."

She shook her head. "Father, honestly, you just can't —"

He shut the door to the drive. "We must bring reality under control. The technology we turn against ourselves can be turned to fortify that weak link in our brains which always seeks to deceive us about our own natures! I'll show you how. You've had the lecture — now the demonstration. Go and sit in the other room at my chair and watch Number Five monitor screen."

Putting his hands on her shoulders, he guided her from the kitchen. He noticed how stiff and lifeless her body felt, and hurriedly removed his hands. In time to catch the expression on his face, Anna turned and said, "Father, I do want to be of help to you — desperately! It's awful how people in families get all tangled up with their relationships, but I do want to be more of a dau —"

"Demonstration first!" he said, briskly, pushing her forward. "Get in there and sit patiently watching Monitor Five. That's all you have to do."

SIGHING, SHE WENT THROUGH into the living room. Most of its original furniture had been pushed back into one corner. An old sofa covered the unused fireplace. There were cushions, occasional tables, a magazine rack, and an old box piled on top of the sofa. The room had been further reduced in meaning by the partition across it, with the television screen burning on it. Past the side of the partition, she could see through the other door of the room and out through the discomfort of the hall, the eye perforate following the intertwined snakes of black cable, into the garage, with its empty crates and wall of breeze blocks.

She sat at the console, took a tissue out of her handbag, and blew her nose. The headache was there in full force, despite two aspirins she had swallowed with her coffee. The atmosphere was leaden.

On the large screen burned an image which she recognised as one of the bedrooms, although it was years since she had been upstairs. Despite herself, she was interested and, as she scrutinized the picture, tried to reason why she should be. She could see through an open door to a landing across which light and ill-defined shadows of bannisters lay, to a corner of wall; the continuation of landing had to be deduced from the chiaroscuro eclipsed by the bedroom doorpost. From this glimpse, Anna deduced she was seeing a view from the spare bedroom at the top of the stairs.

Inside the room, she could see the foot of a bed, part of a wardrobe, and a picture hanging against a patterned wallpaper. She leaned forward instinctively, interested to see if the bed were made up. It appeared not to be. She also stared at the picture on the wall. A man, perhaps a soldier, was holding a pike or a spear and gazing fearfully upwards at the entrance to a forbidding alley; behind him, something awful was going on; but she could make little of it.

All, on the surface, was dull and without any power to enchant; yet she felt herself enchanted.

The colours were of high quality, conveying an impression that they were true to reality but perhaps enhanced it slightly. For instance, the landing carpet: mauve: but did it actually present those tender lavender contrasts between shadowed and unshadowed strips? Or was it that the colours on the screen were true and one merely paid them a more attentive respect because they were images of the real thing? Was there an art about the reproduction that the reality lacked?

She noted belatedly that the sound was on, so that she was actually listening to this silent vista as well as watching it. And she noted something else: that the viewpoint was low, as if the camera was fixed just above the skirting. So one was forced into the viewpoint more of a child than an adult. That might explain why the shadows radiating from the wardrobe seemed both somewhat emphatic and somewhat menacing, as well as accounting for some of the fascination of the picture as a whole.

But was it a live picture or a still? Anna was convinced it was no still. Some quality about it suggested a second-by-second congruence with her own life. Yet how to be sure? Of course, a long enough vigil would reveal movement in the shadows, or a diminution in light towards evenings; but she found herself looking for a spider crossing her field of vision, perhaps a fly trapped in the room, circling vaguely under an overhead lamphade. Nothing moved.

With an involuntary shiver, she thought, "That room's as lifeless as the top of Everest. It's not a real room any more — it's just a fossil!" Her attraction changed to revulsion and she looked down at the row of monitor screens to obey her father's directions.

Eight of the nine small screens were lit. All showed static views of rooms and, in the eighth, she saw duplicated — in miniature and in black-and-white — the view projected on the big screen. Its smallness gave it an even more hypnotic quality. It frightened her. As she averted her eyes, she caught sight of her father in the fifth screen, moving purposefully across it. Almost as soon as he was lost to sight on that screen, he was caught advancing in Number One screen, coming from a shadowy passage, and then he materialised in the room in person.

"Did you watch closely? What did you make of the

demonstration?" he asked.

"She stood up, vexed with herself.

"I was so fascinated with the view on the big screen. . . I was only just about to watch Number Five monitor."

Felix frowned and shook his head. "Such a simple thing I asked you to do—"

"Do the demonstration again, father. I will watch this time, honestly! I'm sorry!"

"No, no, it was just a small thing, as I warned you. To do it after this fuss would make it meaningless."

"Oh, no, that can't be so, surely. I wasn't making a fuss. I won't find it meaningless. You didn't give me enough time. You didn't give me a proper chance—" To her own dismay she began to cry. Angrily she turned her back on him, fumbling in her bag for a tissue.

"Always these overheated personal nonsense!" Felix shouted. "Isn't it enough that you should have been stupid without compounding it by bursting into tears? Dry your eyes, woman! — You're as bad as your mother!"

At that, she cried the louder.

When she turned round at length, he had left the room.

She stood there in a melancholy containment, with the unwinking monitors by her right hand. Should she leave, despite her headache, so much worse after the fit of weeping? Did he expect her to leave? And how much did his expectations influence whether she would actually leave or not?

In any case, it was past lunch time. She could either rustle up something from the kitchen, where she had found a surprisingly well-maintained range of food, or she could go down to the pub in Crackmore. She had meant to take him along to the pub, but his insufferable behaviour put a different aspect on things.

She glanced at the screens to see if she could catch sight of him. The view on Number Seven monitor was moving slowly; she looked and realised that the movement of the camera was automatic. The screen showed another bedroom, evidently her father's from its state of occupation. There was a cupboard, one door half-open to reveal suits within, and an untidy pile of clothes on a chair. She supposed the laundry man still called every week. The bed was unmade. The viewpoint was moving beyond it in a slow arc, taking in blank wall, an angle between walls complex with diffused shadow, then a window — seen obliquely, but revealing the tops of unkempt trees in the drive by the front gate — then the wall between windows, then the next window, rolling gently into view. . . . No father there.

He had built neat switchboards; she realised that everything could be controlled from here. If she could set all the cameras tracking, then presumably she would detect him in one of the rooms. Tentatively, she pressed one of the piano keys nearest to her.

His voice came out at her. "—st lot of tinned meat gave me diarrhea. . . . My evolutionary discovery is greater than Charles Darwin's or his grandfather's. . . greater and far more world shaking. Darwin revealed only part of the truth—"

She switched him off.

He was mad. No doubt of it. Madness suited him — there had always been a madness in the distance he had kept between himself and everyone else.

He was probably dangerous too. Men with monomania were generally violent when opposed. She'd better be careful. But she'd always been careful. And really — she told

herself in the thick ticking room — she had hated him since childhood.

She saw him on Number Four screen. He must have rushed outside to avoid her crying; now he was entering the house, turning to close the door — my God, was locking it! Locking it! What did he mean to do?

Anna ran out of the nearer living-room door and into the kitchen. Panic momentarily overcame her. She ran across the kitchen and pulled open the door. Surely he was intending to trap her, or else why lock the front door? He had said he never locked it — What was that ghastly phrase? — “If I don’t lock up, I can escape faster”? Nutty as a fruit cake!

She ran from the kitchen. The gravel outside had sprouted so many weeds, so much grass, that it hardly showed any more. She hurried through them, thinking she had better get to her car and clear off, or at least go and get a drink and then return, cautiously, and plead with him to let Stokes-Wallis examine him. . . . As she turned the corner and came to the front of the house, her father emerged from the front door and — no, it was not a run — *hastened* to her car.

Anna stopped a few yards away.

“What are you playing at, father?”

“Are you going already, Anna?”

She went a little nearer.

“You aren’t trying to stop me leaving, are you?”

“You are leaving, then, are you?” His hair almost concealed his eyes.

She paused.

“It’s best if I leave, father. I don’t understand your work, you refuse to explain it to me, and I interrupt it in any case. It’s not just a question of that, either, is it? I mean, there’s the question of temperament, too, isn’t there? We’ve never got on. It was your business — the way I look at it — to get on with me if you could, since I was your daughter, your only child, but, no, you never fucking well cared, did you? I was just an intrusion between you and mother. Okay, then I’ll get out, and as far as I’m concerned you can sit and goggle at your empty screens till you fall dead. Now get out of my way!”

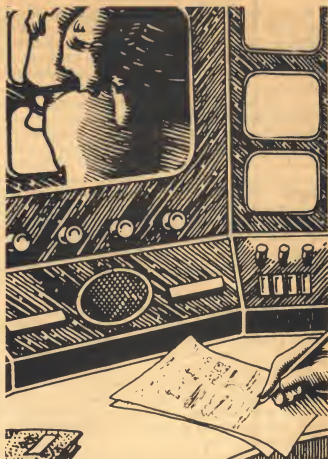
As she came forward, Felix stepped back from the car. He let his gaze drop so that his eyes were completely hidden by the overhanging lock of his hair. His arms hung by his side. In his stained grey trousers and his torn sweater, he looked helpless and negative.

Proud of her victory, Anna marched forward and grasped the door handle of the Triumph. As she pulled it open, he seized her fiercely from behind, locking his arms round her so that her elbows were pinned against her sides.

She yelled in fright. A passenger jet roared overhead, taking up and drowning the note of her cry while he spun her round and dragged her into the house.

Even in her fury and fear, she found time to curse herself for forgetting that mannerism of her father. How often as a child had she seen him doing as he did then, suddenly turning deceptively limp and passive before springing on her like an enemy! She should not have been deceived! — But of course memory so often worked to obliterate the miseries of reality!

Once he had got her into the hall, he pulled her toward the side door into the garage. Anna recovered her wits and kicked backwards at his legs. He was immensely strong! To-



gether, they tripped over the cables in the entrance and half-fell down the concrete step into the garage. As she broke from his grip, he caught her again and momentarily they were face to face.

“You’re the enemy!” he said. “You’re one of the non-humans!”

Above their heads were unpainted wood shelves, crudely fixed to the wall with brackets and loaded with boxes and spools of plastic covered wire. Pinning his daughter to the wall, Felix reached up and dragged down one of the spools. The action tumbled a couple of boxes, and nails cascaded over their heads. Tugging savagely at her, Felix commenced to bind her round and round with wire, securing her ankles as well as her wrists.

He was just finishing when they heard a distant knocking.

Felix straightened. He pushed his hair from his eyes.

“That’ll be the grocer. Don’t make a sound, Anna, or I’ll be forced—well, you know what I’ll be forced to do!” He gave her a hard straight look which included no recognition of her as a human being.

As soon as he had got into the hall and was making for the kitchen, from which the knocking came, Anna struggled upright and hobbled towards the door. It was impossible to climb up the step into the hall with her ankles bound; she fell up it. Before she was on her feet again, her father was coming back. He had a letter in his hand, and was smiling.

“A Glasgow postmark—this will be from Professor Nicholson! The grocer kindly brings my mail along from the post office. He’s a good fellow. He recognised your car; I told him I was having the pleasure of a visit from you. Now, my dear, we are going to get you upstairs. If you help your-

self a bit, it won't be so painful."

"Father, what are you going to do with me? Please let me go! I'm not a little girl any more, to be punished when I disobey your orders."

He laughed. "No, you are far from being a little girl, Anna. Just how far, I intend to discover for myself."

She stared at him in shock, as if for the first time the helplessness of her position was made real to her. He read her expression and laughed again, a lot less pleasantly.

"Oh, no, my dear, I didn't mean what you think—whatever fantasies you entertain in the depths of your mind!"

"You don't know what I'm thinking!"

"I don't want to know what you're thinking! What a miserable generation yours was, obsessed by sex, yet totally unable to come to terms with your own sexuality. Your mother and I had a far better time than you or any of your friends will ever have!"

By dint of pushing and lifting, he got her upstairs and trundled her past the bathroom into the bedroom whose door stood open opposite the head of the stairs. She found herself in a bedroom at the back of the house, recognising it indifferently as the room she had seen on the viewing screen.

"Now!" he said, looking round frowning.

He loosed some of the wire from her ankles, led her over to the bed, and tied her legs to the bedpost, so that she was forced to sit there. Then he disappeared. She heard him going downstairs. A minute later, he was back, a tenon saw in one hand. He knelt by the door and started to saw low down on the leading edge. When he had got six inches in, he stood and kicked vigorously at the bottom of the door. The wood splintered and a piece sagged outward. He kicked at it until it was loose.

The door would now shut, despite the cables trailing over the floor. Looking meaningfully at her once, he went out, and she heard him turning the key in the lock. She was properly imprisoned.

Impotently listening, she heard him march downstairs. Silence, then the sound of the Triumph engine starting up. What a fool she was to have left the key in the ignition—by no means for the first time! But he could always have taken the key from her bag; she had left it in the kitchen.

She heard the car engine fade almost immediately; so he had driven it round the side of the house, parking it beyond the kitchen door, where it would not be noticed from the road.

The grocer might see it when he called again—but how long ahead would that be? Evidently no postman called—the grocer had agreed to deliver her father's post. Perhaps no other tradesman came up this cul-de-sac; her father might well rely on the friendly grocer for all supplies. Of course, she had told Trevor and some of the fellows in the labs where she was going, but Trevor was not to be relied on, while the rest of them would not give her another thought until Monday, when she did not show up for work. She was on her own.

Well, that was nothing new. It was just that the situation was more extreme than usual.

Anna was already working to free her hands. It should be possible. She had already noticed that her father had left—carelessly or by design?—the saw on the floor by the door. It might come in useful.

The front door slammed.

Brian W. Aldiss

Of course, he could watch her over the Omniviewer. She glared across the room at the dull lens of the camera, braced in the wall against the disused grate, a foot above floor level. She would just have to hope that he was unable to watch all the time.

Her feet were less tightly tied than her wrists and arms. After working away carefully, she managed to slip one of her brogues off, and then to wriggle her stockinged foot from the coils. The other one came out easily, and she could walk round the room.

Still pulling at her wrists, she ran over to the window and looked out.

Clouds had piled up in the sky. The afternoon was torpid. She was looking over what had once been a vegetable garden. Impenetrable weeds grew there. They stopped at the high wire fence, drab green and stretching away into the distance. Beyond the fence lay the airport, flat and featureless. She could see no building from this window, only a distant plane, deserted on a runway.

The view was blank and alien. It offered her no courage.

Hooking her wrists over the catch of the window, she pulled and wriggled to such effect that in a minute her hands were free. As she rubbed her hands together, she listened for his footstep on the stair.

Just how dangerous was he? She could not estimate. That he was her father made it all more difficult to calculate, more bizarre. If he came up, would he not, this time—at last—put his arms round her and love and forgive her for all her shortcomings?

No, he bloody well wouldn't!

The door was locked, as expected.

ANNA CROSSED to the single picture on the wall above the bed, a sepia reproduction mounted and set in a solid oak frame. As she pulled it down, she saw that it represented a Roman sentry in armour standing guard before a gateway leading into a luridly lit court in which people were dying and dead—flares of some kind were falling from the skies onto them. The picture was called 'Faithful Unto Death'. She swung it in front of the camera, propping it against a chair so that the view was obstructed. Then she opened the window and looked out.

Felix Macquire was standing among the weeds aiming a gun of some kind at her. A rifle, possibly. Aimed at her. Half-fainting, she sank back inside the room.

Leaning against the wall, she heard him shouting. She began listening to his words.

"I'd have fired if you'd tried to jump. I warn you, Anna! You may not fully understand the situation, but I do. The fact that you are my daughter makes no difference. You are not going to leave here, or not until I say you can. Professor Basil Nicholson is coming tomorrow, and I want him to look at you. Behave yourself and you'll come to no harm. If you don't behave yourself, I'll lock you in the landing cupboard without food. Forget you're my daughter—remember you're my captive. Now then—shut that window. Do you hear, shut the window?!"

She summoned enough presence of mind to look out and say, though without all the spirit she hoped for, "Try and realise what you are saying and doing, father! You are now formally renouncing me as your daughter, which is what you have wished to do all your life. You are also threatening to

shoot me!"

He said angrily, "This is a French carbine, used against rioters. I'll fire if you don't get back. I mean every word." A few drops of rain began to fall.

"I'm sure you do! I don't doubt that. I'm sure you do! I'm sure you'd love to fire. But you should recognise what it means. You have now crossed the dividing line between sanity and madness. You are also committing a criminal act!"

"Get your head inside and close—" His words were drowned by the roar of an airliner coming in to land, but his threatening gestures were enough for her. Anna pulled her head back and wearily shut the window. She laid down on the bed and tried to think what she should do. Her stomach rumbled like thunder.

It was a problem to understand how matters between them had deteriorated so rapidly. Was it just because she had forgotten to watch his demonstration on the monitor, or because of some other fault of which she was unaware? And what had the demonstration been? Something minor, despite its build-up, that was clear: perhaps merely watching her father in the kitchen over the closed-circuit. Instead, she had been hooked into watching an empty room—this room. "Getting control of reality": that had been his phrase. Had he, her all-powerful and untouchable father, been rewarded for his years of isolation—whether unwished for or self-imposed—by some amazing insight into the physical conditions governing man? Had he really stumbled on an equivalent to Galileo's proof of the heliocentric system? It was not past the bounds of credibility—but nothing was past the bounds of credibility these days. And if he had so done, he would naturally be impatient (though *impatient* was scarcely the word) with any silly girl who failed to follow him closely when he attempted to explain.

She lay looking up at the ceiling. She could hear rain outside, and another slight sound. The camera was still working.

Warmth and comfort overcame her. Perhaps the aspirins were taking effect; her headache had gone. She began to recall summer days in their old house, before she had grown up, when her mother was alive, and she had lain as she was now lying on her bed, idly reading a book; the window was open to the summer breezes, and she could hear her parents down in the garden, exchanging an odd sentence now and again. Her mother was gardening, her father working on a monograph on lacunae in the theory of evolution which never got published. Evolutionary theory was always his hobby—a complete contrast from the pushing world of electronics into which his job took him. She had put her book down and gone over—yes, she had been barefoot—gone over to the window and looked out. He had waved to her and called something. . .

"Can you hear me, father? I didn't mean to miss your demonstration, whatever it was, if that is why you're punishing me. If possible, I'd like to understand and help. It could be that when watching the big screen I had a useful insight into what you meant about reality. A view over the screen is different in some undefined way to a view direct, isn't it?"

No answer. She lay looking up at the ceiling, listening. She had often listened like this before going to sleep as a child, wondering if someone would come up and visit her. The ceiling blurred; suggestions of warmth and other modes of being moved in; she slept.

34 GALILEO

FELIX MACGUIRE SAT at the console, resting his elbow on the desk and rubbing his chin, as he peered at the big screen. It showed part of a scene at the Herculanean Gate of Pompeii in A.D.79, with the inhabitants about to be destroyed; a soldier in close-up stood at his post, eyes raised fearfully towards the unknown.

The light values on the soldier's face changed almost unnoticeably as Felix ran back the tape and played over again the words his daughter had spoken.

"... had a useful insight into what you meant by reality. A view over the screen is different in some undefined way to a view direct, isn't it?"

He ran it back again listening mainly to the tone of her voice.

"I didn't mean to miss your demonstration, whatever it was, if that is why you are punishing me. If possible I'd like to understand and help. It could be that when watching the big screen I had a useful insight into—"

He clicked her off. Always that pleading and cajoling note in her voice which he recalled from her childhood. A jarring note. No wonder no man had ever married her.

Silence in her room. But it was not the usual silence he received from Number Two bedroom. The usual silence had a sort of thin and rather angular dazed quality unique to itself, resembling the surface of a Vermeer canvas, and with a similar sense almost of *planning* behind it; he thought of it as an intellectual silence and, of course, it differed from the silences in the other rooms. With Anna's occupancy, the silence took on an entirely different weight, a bunched and heavy mottled feeling which he disliked.

The sound levels were so good that he could detect when she was drifting towards sleep. It was her way of eluding reality; a little editing of tape would soon bring her back to her uncomfortable senses.

SHE ROUSED, sat up suddenly, aware that her mouth had fallen open. Someone was whispering in the room. She had caught the sound of her own voice.

"... a useful insight. . ."

Then her father's voice, indistinct, and then her own, perfectly clear:

"Can you hear me, father?" And his reply:

"Why didn't you watch what your mother and I were doing? You're old enough to learn the facts of life."

"I didn't mean to miss your demonstration, whatever it was, if that is why you're punishing me."

"What do you mean, 'whatever it was', Anna? Come back into the bedroom and watch—we're just going to start again."

"If possible, I'd like to understand and help."

"That's better. Jump in with your mother. You'll soon learn."

She sat on the edge of the bed, flushing with shame.

"You're right round the bloody twist, father!" she said aloud. "For Christ's sake let me out of here and let me go home. I'll never bother you again—you can be sure of that!"

He came in the bedroom door, grinning in an uneasy way.

"Forget all that—just a bit of innocent fun! You see what can be done with reality! Now look, Anna, you present me with a bit of a problem. I'll have to keep you

WHERE THE LINES CONVERGE

here overnight, so you'd better resign yourself to the fact. Basil Nicholson is coming tomorrow—his visit is very important to me, because for the first time I'm going to present my findings to an impartial outside observer. Nicholson and I have been in communication for months, and he's sufficiently impressed by what I've told him to come and look for himself. You could be useful in more than one way. So you'll have to stay here and behave. If all goes well, you can go home tomorrow afternoon. Okay?"

She just sat and stared at him. The whole business was too horrifying to be believed.

Felix picked up the framed engraving and hung it back on the wall. As he went towards the door, he picked up the saw. He smiled and waved it at her, a gesture part friendly, part menacing.

"Why don't you kill me, father? You know I can never forgive you—pointing a gun at your own daughter. I saw murder in your eyes, I did."

He paused with a hand on the door. "Never forgive? You can't say that. Never forgive? Never? Think what a long journey it is between birth and death. Anything is possible on the way."

"Go to hell!"

"Think what a long journey you and I have come, Anna! Here we are together in this house; perhaps in one sense we have always been here. Perhaps it doesn't matter that we don't understand each other. Perhaps we hate each other, who knows? We make the journey together. It's like crossing a glacier—in moments of danger, all the various differences between us become unimportant and we are forced to help each other to survive. There's no way of making sense out of such testing journeys until we have the tools to understand what human life is about."

Anna fumbled in her pocket for a tissue. One nostril was blocked with incipient cold. "I don't want your philosophising."

"But you must understand what I'm saying. Nobody lives out their life without being brought up against a sudden moment when they see themselves as in a screen or mirror and ask themselves, 'What am I doing here?' Once, it used to be a religious question. Then people started to interpret it more in socio-economic terms. Your generation tried to answer it in terms of individual escape, and a poor job they made of it. I'm trying to provide an evolutionary solution which will take care of all the other aspects."

He sounded so reasonable. She was baffled by his changes of mood, always had been.

"If you didn't want to have me here, you should have phoned and told me so. How can you ill-treat me so? I've never harmed you. Pointing that gun at me! I just want to go away—I don't know whether I can ever recover from what you've done to me."

"You keep saying that. Try and pull yourself together, Anna. We're father and daughter—nothing can ever come between us, not even if I had to kill you."

He had put his arm round her, but now she drew away, looking at him with a face of dread seeing only a blackness in his eyes and a cruel estrangement round his mouth.

"I want to go now, father, if you don't mind. Back home. Please let me go. I've never done you any harm. Let me go and I'll never bother you again!"

He was as unmoving as stone.

"Never done me any harm? What child has not harmed

its parents? Didn't you, every day of your life, come between your mother and me with your insatiable craving for attention? Didn't you drive her into an early grave with your perpetual demands? But for you, wouldn't she be here, on this very bed, with us now?"

"Your evolutionary theory, father—are you sure you ought to talk about it with Nicholson? Shouldn't you publish a paper on the idea first? Or write to *Nature*, or something?"

He was standing now and looking down on her. She had hunched herself up on the bed with her legs tucked under her.

"You're frightened, aren't you? Why should you be interested in my theories? As—"

The roar of a plane swamped his sentence. For a moment, the room was darkened as the machine passed low overhead. It seemed to distract Macguire's attention. He wandered over to the window.

"The sooner we get control of reality, the better. One of these days, they're not just going to fly over—they'll drop an H-Bomb on me, right smack down the chimney, since they can see their warnings don't scare me off." He turned back to her. "I must prepare my notes for Nicholson's arrival tomorrow. You'd better come down and clear the place up. If there's time, I'll give you the demonstration I plan to give him and see how you like it. This time, you'd better attend."

"Oh, I will, I will, father."

He walked out of the room, still clutching the saw in his hand. She hesitated, then climbed off the bed and followed him downstairs.

"The front door's locked, by the way, Anna, and I have the key in my pocket."

"I wasn't thinking of going out."

"No? Well, it's raining, but just in case you were."

He went into the living room, pushed past the partition, and sat down at his console as if nothing had happened. She went into the kitchen, leaned her elbows on the window sill and buried her face in her hands.

After a while, the involuntary shaking in her limbs died away and she looked up. The house was absolutely silent. No, not absolutely. The camera made a faint registration of its presence. With very intent listening, she could hear slight movements from her father in the next room. She looked at her watch, decided to make a cup of tea, and started the soothingly traditional preliminaries of filling the kettle, switching it on, and getting down teapot and teacaddy from the shelf.

"Like a dutiful daughter, you are making me a cup too." A loudspeaker.

"Of course, father."

How could she persuade him that she loved him? It was impossible, because she did not love him. She had failed to love him. Shouldn't love have sprung up in her spontaneously, however he behaved, the way spring flowers—the modest and incorrigible snowdrops—bud and blossom even in the teeth of chilly winds? The truth was that she understood so little about herself; perhaps she even hoped that he would carry out his direct threats.

When the tea was made, she put everything on a tray and carried it through to him. Felix smiled and motioned her to put it on a side table.

As she did as he indicated, she saw the carbine. Her

father had stood it in the corner behind him. It was ready for action, she thought—was he secretly planning to grab it up and shoot her?

"There are some chocolate biscuits in the cupboard over the sink, if you'd like to get them. You always enjoyed chocolate biscuits, Anna."

"I still do, as it happens." She fetched the biscuits.

He drank his tea absently, staring into the miniature screens, switching the view from one or another on to the larger screen, scrutinising his static universe. Finally he settled on a panorama of the dining room through Camera Six, with the table, loaded with electronic gear, to one side of the screen and most of it filled by wall and desolate fireplace. This cheerless scene held his attention for so long that his tea grew cold by his elbow.

Anna sat staring towards the carbine.

At last, he sighed and looked up at her.

"Beautiful, isn't it? Human environment with humans abstracted. Almost a new art form—and utterly neglected. But that's neither here nor there."

Silence.

"Father, would it annoy you to explain to me what you see in the screen?"

"I see everything. The history of the world in that one shot. The grate, designed to burn fossil trees trapped in the earth since they grew in the jungles of the Carboniferous Age. Look at its Art Nouveau motif on the black lead canopy. All obsolete. A great age of mankind gone for ever. Fires will never burn there again, prehistoric energy never be released there. Now the only function of that fireplace is to form part of this picture. The function of the picture is to activate part of my brain. My brain has been activated by retinal designs, formed in this house, never viewed before. I view them every day. They have made me conscious of my own brain structure, which in turn has modified that structure, so that I have been able to fit together facts—facts available to anyone through evolutionary study—and make them into a new whole. A new whole, Anna. You'd never understand."

He paused and drank down his cold tea.

KEEPING HERSELF under control, Anna reflected on the virtue of sanity; it was not half as boring as madness. With sudden impatience, she said, "Spare me the reasoning, please. Give me the facts. What exactly is this theory you keep bragging about?"

He looked rather guiltily up at her. "You must let it all soak in gradually. It needs practice to understand."

"I'm sorry, father, I have a job to go back to. You may not think it important but it is important to me. If you will not show me straightforwardly, then I shall have to leave before it gets dark."

He digested that. "I hoped you'd stay and have a bite of supper with me." His mild manner suggested he had forgotten his earlier threats.

"Why should I, after the way you have treated me? Explain at once or I shall go."

"He shrugged. "As you will. If you feel up to it."

Pushing his teacup out of the way, he fiddled with various switches, rose, and messed about behind the partition, before saying, "Right, then, watch this carefully."

She dragged her eyes from the weapon in the corner.

The big screen lit. Anna looked with interest, but there

was nothing except yet another view of the interior of the house. This was Camera Three working, moving slowly, so that the viewpoint descended from the upper landing to the hall, to a slow moving shot of the hall cupboard and the ever open door through to the garage. In the small section of the garage revealed, the door into the workshop could be seen. Only the eternal gleaming black cables, running across the floor, gave any sense of life. Then she saw a shadow move in the workshop. A man came through into the garage. She gasped.

"It's all right. This is tape you're watching."

The man emerged into the hall. It was Felix, rather blank faced, hair slanting across forehead. Without pausing, he moved forward and along the corridor towards the kitchen.

Now the scene was a blank again, unpopulated. The camera eye travelled over it in a leisurely and dispirited fashion. A shadow moved in the depths of the picture and a man passed from workshop to garage. Anna instinctively leaned forward, expecting something—she did not know what: something to frighten her. The man came out of the garage into the hall. It was her father, somewhat blank faced. Without pausing, he moved out of camera range in the direction of the kitchen.

"Keep watching," Felix ordered.

The screen still showed only the view of the hall, its shadows, and the angles and perspectives created by the doorways beyond—a pattern that, by constant wearying repetition, seemed at once to annihilate sense and to acquire an ominous significance of its own; just as the single note of a dripping tap, listened to long enough, becomes an elusive tune. When something stirred in the shadows beyond the furthest doorway, she was prepared for it, prepared for the man who stepped from the workshop to garage and then, after a pause, from garage to hall. It was her father, wearing his old sweater. Without pausing, blank-faced, he walked towards the kitchen and was lost from view.

The hall was empty. In a brief while, the whole insignificant action was repeated as before. Then it was repeated again. And again. Each time, the same thing happened.

At last the screen went blank, just when Anna thought she would have to scream if it happened once more.

"What have you seen, Anna?"

"Oh—you know. You coming out of the garage a million times!"

"Live or on tape?"

"On tape, obviously. The first time round, I thought it was live—well, except that you were here beside me. What does all that prove?"

"If I'd been hidden in the kitchen, you couldn't have told what you saw from live. Or any of the re-runs, if they had been shown first."

"I suppose not."

"How many times did you see me come into the hall?"

"I've lost count. Twelve? Eighteen?"

"Nine times. Do you imagine they were all re-runs of one occasion on which I came into the hall?"

"Obviously."

"It's not obvious. You're wrong. What you witnessed was me coming into the hall on three different occasions—three different days, in fact. Each was re-run three times. And you didn't spot the difference?"

"One time must have been very like another." She was

wary of the nonsense of his solemnity. "You always looked just the same. The light always looked just the same. Obviously the house always looked just the same."

"Okay. You're talking about the scientific theory of convergence."

He pressed a key, ran the videotape until he was once more stepping from garage to hall; then he froze the action. Staring out at his image, he said, "Obviously, ways of getting from one room to another are always closely alike. Right? So close you mistook them for identical. But they aren't identical. I've tried to remove the difference between one day and the next in this environment, as nearly as I can. Yet I—the living!—am aware of the change between one day and the next, as you were not when witnessing that change on the screen."

"Animals that adapt to similar environments and pursue the same inclination also tend to resemble each other. However alien the animals themselves may be from each other, there are only a limited number of ways of getting through a doorway or living in a desert or swimming in a sea. To fly, you have to have wings; there are animals which mimic birds in that respect, and they are examples of convergence."

He pressed a key in front of him, and a shot of the wall of the workshop came up, a grey view with nothing on which to fix attention except three blown-up photographs ranged one under the other on the wall. The photographs depicted three gigantic sea-going creatures, each remarkably similar to the next in its functional streamlined form. Felix left them in view for a while before speaking.

"This is part of the big game I have been hunting for forty years, you might say. You know what these creatures are?"

"Are they all sharks?" Anna asked.

A plane roared overhead. The house vibrated, the picture on the screen shimmered and split into a maze of lines and dots. When it reassembled and the noise died, Felix said, "The top one is a shark. The next one down is a porpoise. The bottom one is an ichthyosaur. They all look alike—prime examples of convergence; yet one is a cartilaginous fish, one a marine mammal, and the other an extinct marine reptile—inwardly, they are nothing alike."

She fidgeted a little. It was growing dark and she wanted to be away from the house and its insane pedant. The rain had ceased; all was still outside, with the stillness of dripping trees.

"That's hardly a discovery, father. It has been known for a long time."

His head drooped, his shoulders slumped. She feared that he was about to burst into one of his insane rages. When he looked up again, his face was distorted with anger, so that she hardly recognised him, as if he had undergone some uncharted Jekyll-Hyde transformation. Instinctively, she took a step back. But he spoke with a measure of calm.

"You do not believe in me, you stupid vegetable. . . Have the wit at least to hear me out when I try to explain everything in layman's language and by analogy. My discovery is that there are creatures as strange as fish and extinct reptiles that go about the world under the same forms as man!"

Anna's first terrified thought was that he was living proof of his own hypothesis. Was there not, in that mottled jowl, that prognathous face, those blazing eyes, something

that argued against idiothermous origin and whispered of a reptile brain lurking like an egg inside that bony nest of skull?

He stood up and stood glaring into her face, so that they confronted each other only a few inches apart.

"Reptiles structurally similar to man, he said. "Forms almost identical, intentions entirely different. Why is our world being destroyed? Why are the seas being polluted, why are nuclear weapons proliferating towards a holocaust, why do human beings feel increasingly powerless? Because there is an enemy in our midst as different from us as moon is from sun — an enemy intent on wiping out human civilization and reverting to a Jurassic world it still carries in its mind. These enemies are old, Anna, far older than mankind, still carrying a heritage from the Mesozoic in which they were formed, still hoping to bring the Mesozoic back down about our ears!"

With a mingling rush of light and dark in the room, another plane roared overhead, making everything in the room shake, Anna included.

Felix rolled his eyes up to the ceiling. "There they go! They are gradually assuming power, and power for destruction. Men develop the technology, reptile-men take over its results and use them for destructive ends!"

She clutched at her throat to help bring out her voice. "Father—it's a terrifying idea you have. . . but. . . but it's— isn't it just your fancy?"

The clouded swollen look was still on his face.

"There is archaeological evidence. Nicholson knows. He has some of it. Evidence from the past is all too scarce. There's my quarrel with Darwinism—a fine picture of evolution has been built up on too little evidence. The layman



believes that deceptively whole picture of dinosaurs dying out and mammals developing, and finally homo sapiens rising out of several extinct man forms; but the layman fails to realise how the picture is in fact conjured up merely from a few shards of bone, a broken femur here, a scatter of yellowed teeth there. . . And the picture we now accept is wrong in several vital instances."

"You may know that there is no understanding of why all the species of the two dinosaur genera, the *saurischia* and the *ornithischia*, suddenly died out. Ha! The reason for that lack of understanding is that they did not die out. Both the saurischians and the ornithischians were capable of tremendous variety, adapting to all kinds of conditions, even achieving flight, covering the globe. Both produced creatures which walked on their hind legs like man. But the saurischians also produced a man-creature, evolving from the theropod line."

"Is there physical proof of the development of this creature?"

"There is no physical proof of the development of any dinosaur—for all we know to the contrary, the brontosaurus and tyrannosaurus may have popped out of existence overnight. . . But a few remains of a late development of reptile-man have been found. You have heard of Neanderthal Man, I presume?"

"Certainly. You aren't going to tell me that Neanderthal Man was a development from a dinosaur!"

"He evolved from the same original stock as the dinosaurs. He was probably always few in number, but he helped kill off the big dinosaurs. The popular folk idea that men were about when the dinosaurs lived is nothing less than the truth—perhaps it's a sort of folk memory."

"Can I put the light on? It's getting dark in here. But you say the line died out?"

"I didn't say that. The so-called Neanderthal is popularly said to have died out. There's no evidence, though. The Neanderthal reptile-men merged with humanity—mammal-humanity, and we have never been able to sort them out since."

She stood by the door, hand on the light switch, again thinking of flight. When the overhead light came on, it made the images of the three marine creatures on the screen appear faint and spectral, more suited to move through air than water.

"Father, my headache has come back. May I go upstairs and lie down in my room to think about what you have told me?"

He moved a little nearer to her.

"Do you believe what I have told you? Do you understand? Are you capable of understanding?"

"How is it that modern medicine has not tracked down these reptile-men if they still exist, by blood-analysis or something?"

"It has. But it has misinterpreted the evidence. I won't go into the whole complex question of blood-grouping. Another problem is that reptile-men and human stock now interbreed. The lines are confused. There is reason to think that venereal disease is the product of interbreeding—another intravenous way in which the two species seek to destroy each other. Do you want some aspirins?"

"I have some eau-de-cologne in my case in the car. May I go and get it?"

"You go upstairs. I'll get your case for you."

Hesitating, she looked at him. Not liking what she saw, she moved reluctantly and walked along the hall corridor, turned right, and went up the stairs under the eye of Camera Three, holding to the bannisters as she went. She paused again on the landing. Reptile-men! Then she went ahead into the bedroom, glanced hopelessly up at 'Faithful Unto Death,' sullen in the twilight, and lay down. She could have locked herself in but what was the point? In his madness, her father would break the door down whenever he felt like it. Perhaps he would come up and kill her; perhaps he imagined she was of reptilian stock.

She played with that idea, imagining the strange and aberrant allegiances it might give her with gloomy green unflowering plants, with damp stones, with immense shapes that moved only when prompted by the sun, and with languid spans of time which could find no true lodgement within the consciousness of man. The idea of being cold-blooded alone made her tremble where she lay, and clutch at the blankets for warmth.

There was a dull light in the room, gloomy, green, and unflowering. Another plane blundered over, shaking the house.

DOWNSTAIRS, he heard and felt the plane go over. He raised his heavy eyes up towards its path, imagining it furry and coleopterous while the room vibrated, saying to it, "One day, you too will lie broken and stoney in a shattered layer of sandstone."

He stood before the big screen, Camera One trained on him, throwing his image over his body. Eyes, mouth, head, limbs, vibrated, became double and detached, then settled back as the noise died.

A memory came back to him from far away that he had said he would go and get Anna's case from her car.

Moving with lethargy, he crossed to the console and set Camera One moving until it was trained through the living room door to the dining room door. This was the nearest he could get to covering the back door; some day, he must install a tenth camera in the passage, so that the back door was surveyed. All he could see on the screen now was the ugly concatenation of angles formed by the two doors between them. He walked out into the passage and headed down it, to the door with two glass panels in its frame which he always kept locked. He unlocked it, opened it, went out.

To his right stretched the length of the back of the house. At right angles to it, another wall stood along the left, punctuated by scullery and pantry windows. An uneven path flanked this walk. He moved slowly along it. There had been flagstones of good York stone underfoot, but weeds and grass had covered them. Blank eyes of scullery and pantry surveyed him.

The light was leaden now. Time and twilight were congealed and fixed like a murdered eye. Like something viewed in a long mirror, he was embedded far in the past, together with gymnosperms, woodlice, the first ungainly amphibians and things still unidentified by the peeping gaze of man.

When he turned left round by the corner of the woodshed, Macguire was only a few feet away from the sterile green wire fence. He knew a lot of things about the colour green; it, more than any colour, was involved in the guilty story of downfall.

He turned left again, pushing aside overgrown branches of elder. They still flowered, individual florets looming up

before his eyes like galaxies in some dim-lit and cluttered universe. Now he was stalking along the south-west side of the house. The weeds of high summer crushed and sprang under his footfall.

There was her car, low under the overhanging branches of trees. Every year, the beeches grew nearer and nearer to the house. Some of them already nuzzled their first tender branches against the brick.

He stood glaring through the windows at the seats within, awaiting people. It was shabby and vacant in there, another unwelcoming human environment, depopulated. On the back seat lay a small case. Macguire pulled open the rear door, grasped the handle of the case, and dragged it out. He stood with it where he was, his other hand touching the car, staring at his daughter. Anna had come round the front of the house; she held his carbine in an efficient way, and was pointing it at his stomach. He looked at her face and saw it too belonged with the lost gymnosperms, woodlice, and amphibians hidden long ago behind the pantry, engendering only extinction.

"You can go if you don't shoot me, Anna. I'm the only one with the theory complete, although there are people everywhere piecing it together. It's a matter of time... It's not a race. I mean, there's no excitement—it's too late now for man to beat the reptile-men; they've had too long and they are virtually in control. Look at the light under these trees—if you understand such things, the light alone will tell you we're defeated. So there's no point in shooting."

"I'm going to shoot." The words came from her mouth. He watched the diagram of it, thinking how easy it was to understand human speech once you had the basic knowledge of the working anatomy of jaw and thorax and the formation of phonemes in the larynx by careful control of air, and how those sounds were carried into the listening labyrinths of those present. His daughter had the science of the whole thing off perfectly.

"I could show you yards of tapex—proof. Proof of all I say. I'm the only one who has studied a human being long enough. I've seen myself, caught myself off guard, I have to regard myself as heteromorphic. The reptile moves in my veins, too."

"Move away from the car."

He said, feeling the stiff discomfort of fear contort his lips and teeth and tongue; "Anna, this isn't the time of day... Just when I'm getting control of reality... Look, you're alien too. It's strong in you. Believe me. That's why you're so hostile. You're more lizard than I. Let me go! I won't hurt you! Let me show you!"

The gun-point lowered slightly. A moth blundered through the space between their two ghastly faces and fell under the trees.

"What do you mean?"

"I got it on tapex. You can come in and see for yourself. Camera Number Eight. It's betrayed in certain movements. Unhuman movements. The gesture of the hand, the way a knee hinges, spinal tension, hip flexibility, a dozen details of facial expression. Oh, I've observed them all in myself. One hundred and thirty-one differences docketed. Throughout life, human beings are motivated to watch others and not themselves, right from early years when they begin to learn by imitation. I realised years ago I was not fully human. With age, you become less human, the antique lizard shows through more and more—after all, it's the basic stock.

Brian W. Aldiss

That's why old people turn against human pleasures. Now, in your case, you've never had much time for human pleasures—"

"Father—"

Afterwards, she wondered if he had begun to fall before she fired. The first shot curved the top half of his body forward. She fired again. This time he jerked backward, still standing, so that she saw how long and dark and lined his throat was. His mouth opened a little. She had a thought that he was looking down his nose and laughing at her, totally unharmed. She fired a third bullet, but was already trembling so violently that it missed.

An airbus came sizzling over the property so low that she fired again in sheer panic. The bullet whistled into the leaves of the trees, and still her father stood there, rocking a little, hands like claws digging into his belly. Then he fell over backwards, legs straight. When he hit the ground, the force of the fall caused his arms to spring out sideways. He lay there among the mid-summer weeds in that attitude of unknowing, and never moved again. The beeches dripped on him, the erosions of his last July.

His hair was quite wet before Anna managed to move again.

She dropped the gun, then had the presence of mind to fumble it up again and toss it into the car. She picked up the little case and tossed that into the car. She stood over the body.

"Father?" she asked it.

It continued to make its gesture of unknowing.

Fighting her palsy, she climbed into the driving seat of the car. After several attempts, she got the motor going and managed to back away to the front of the house. She gave a last look into that deep grey-green past under the beeches where time had ceased, and drove towards the front gates.

As she passed through them, bumping on to the cul-de-sac road, she experienced a flash of memory. She thought of the electricity still burning, the camera still processing the spirit of the empty house, the big screen still registering daylight dying between an ugly angle of doors, the inhuman sequence of mounting time slithering into tapex.

But she did not pause, certainly did not turn back. Instead, she pressed her foot more firmly to the accelerator, flicked on the side-lights, hunched herself over the wheel to control her shaking, forged ahead towards the tangle of tiny roads between her and Ashmansford.

She stared ahead. The shaggy elms outside the car, blue with advancing night, were reflected momentarily in her eyeballs. Overhead, another plane roared, its landing lights blazing, coming in to roost.

—G—



HE ODOR OF DEW was as heavy as mist in air like perfumed wine, scented by everblooms. Adora was warm, breath sweet, child-face smiling in sleep. She was there.

He always looked for her first thing in the morning.

Stan could have looked at her for an hour, but day waited for no man. He kissed her awake, watched her stretch herself out of sleep like some small, warm animal cub. As ever, she awoke with a smile, blinked red-violet eyes at him sleepily.

"Time to get up, or just time to wake up?" she asked lazily.

"Morning," he temporized.

"Doesn't answer my question," she smiled, eyes closed, hair a red-orange cloud on the pillow.

Day was advancing across the world-girdling forest just beyond the garden fields outside the station; he could smell the dawn odors and hear the dawn cries, but he never got enough of Adora's presence. He took her lithe, slender body in his arms, shook her gently. "Getting-up time!" he said sternly.

"That's what I *thought*," she said, pulling him to her.

The alien scent of her hair was as exciting as any dawn odor even on a planet of perpetual spring.

They had learned to live for the present, not knowing what the future might bring. They were alone but for each other. Perhaps more alone than any two people in the histories of their races.

Adora was not human.

She had run away from her people, the humanoid, forest-living natives of Sandra, to be with him. And if he knew his own race, he'd be as outcast himself if they learned he was living with a nonhuman girl. Particularly of a race they didn't know existed—and wouldn't want to believe existed.

Her strong, girlish body was remarkably human. Small, slender, cat-lithe; with a pointed, pixie face and enormous eyes. Clothing—she habitually wore a green tunic-like dress that hung from her shoulders to her thighs, belted at the waist, and little else—covered most of the differences. Her people were so little exposed to sunlight that they tanned only slightly.

He had to rouse himself again; Adora would have been content to doze smiling away the morning. He dragged her unceremoniously out of bed and dumped her on the floor.

"Work!" he told her. "And you've got your share to do."

She arose still smiling, still sleepy, stretched deliciously before him—and with a swift, smooth movement, slid into her dress. She buckled it staring at him in wide-eyed innocence.

"Don't just stand there," she said. "Work to do!"

Watching her pursed-lip selection of breakfast, Stan was reminded again of the little girl of the forest. She still had the exaggerated seriousness of the child he had known—and the boundless enthusiasm.

At the age of nine, Sandra's rolling forest had been his playground, a fairyland of wonder and delight, a colonnaded cathedral with a cathedral's dim noonday hush and the warm wild smells of a far, foreign clime. It had worried his parents, but it was safer than the overcrowded and poorly supervised recrooms of Earth. The giant carnivores hunted only by night.

The forest swept for thousands of miles across the planet in every direction. The trapping station was an island of

Robert Chilson

ADORA

The alien scent of her hair was as exciting as any dawn odor even on a planet of perpetual spring.



DEAN MORRISSEY

warmth in a sea of loneliness. But it was not an empty sea.

It was there that Stan had met Adora.

Even at that age they'd known enough to keep their meetings secret.

Suddenly he remembered one of those meetings: Adora's enormous violet eyes peering down from the shadowed gloom above him. "I've been *waiting and waiting*," with childish emphasis. "You an' your *bist'ry*."

Himself, voice high-pitched, panting: "I can't help it. Anyway, you were late day before yesterday."

She tossed her head and sniffed. "Not *this* late. Anyway, that wasn't my fault. Karek moved the tribe."

"I'm gonna be here *first* tomorrow."

"Ha."

"Oh well." He stood up and approached her along the limb. "I'm a merak," he announced. "Better run. I'll get you."

She watched him with widening, darkening eyes, clutching her bare toes. "Meraks can't catch felshim."

"This one can."

As one animal or another, he had chased her all through the forest. Tree trunks, limbs, branches, vines, and parasitic trees made a continuous highway for the agile, and Adora was very agile. She never chased him, though; he could never stay ahead of her for more than a few minutes.

"There!"

Finished. "Preparing" breakfast was a matter of punching the code for the desired food, then instructing the robochef on how it was to be cooked. A simple thing, but one that frightened Adora. She had never overcome her primitive fear of the trapping station's intelligent machines. She therefore deserved — and got — a reward whenever she faced it without flinching.

"Better pack a good-sized lunch," he told her after breakfast. "It's time to go over Quartzbottom Creek."

The sun was just showing behind the giant trees of the forest a quarter of a mile away. Sundrops of liquid gold oozed through that wall and dripped around them, making the dew sparkle on the lawn of Terrestrial grass. The morning mist was thin and blue and clean and cool, hazing the open fields and fading indeterminately into the forest between the great tree boles. It was the kind of morning that made one want to shout.

Adora took his hand. "It's *wonderful*!" she cried, waving an arm in an all-inclusive gesture. She seemed a thing of the unspoiled wild, peering with large violet doe's eyes at the hidden nooks of the sleeping forest; a moment later laughing up at him, aware of his feelings — half imp, half angel.

"Come on," she urged, tugging. "It'll be hot before we get started."

They walked hand in hand down a stone-flagged path to the machine shed, half buried in a riot of flowering vines. Stan stopped to point out flowers beside the path and tell her their Standard English names. Adora never tired of his mother's off-planet flowers.

The shed's transparent dome was so overgrown with vines that the interior was like some heavily-leaved arbor. Even the agrirobot might have been some great animal at ease. But it never rested; it was waiting now for further orders. At one end — the waist-high, six-foot-long capsule-shape had no front or rear — was a hatch that opened on a control board.

The robot had finished its last task and needed no re-

pairs. Stan set it to seed the last field broken with Kelsonian wheat-shrub. The robot rose several inches off the floor on gravitronic motors and coupled a multiple seeder onto itself.

The smoothly efficient agrirobot captivated Adora, though she feared most robots. It was like some great hunting animal; quiet, strong. She perched on its rounded back, which it ignored, and handed it the seed-boxes. This always disconcerted it. It would check in confusion, track the moving seed box, then reach deliberately out to intercept it with its mechanical arm.

Adora was childishly delighted by the almost living bafflement the machine displayed — then awed at the powerful assurance with which it reached for the object. She always let go just as the mechanical fingers closed on it.

Ignoring her, the robot swung around and glided smoothly toward the door. She bounced nimbly off as it passed Stan.

"This afternoon," he said, "we'll have it harvest our last crop of appleroot. We'll want to avoid storing up too much food when I'm in school, though."

"I like to have a good margin. I've gone hungry too many times."

"I wish you wouldn't say things like that," he complained. "You're supposed to be a beautiful child of nature and should keep complaining that the only way to live is off nature's bounty."

She laughed, a lilting song. "Nature is much more bountiful when you help her along with your machines, even if they do scare me." She looked up wide-eyed. "Tell them I complimented them, will you, please?"

They checked to make sure that all they'd need for the day's work was aboard the aircar. Adora handed in a basket, made sure that the right parcels were put in the car's fridge. Stan lifted off, the gravitronic motors silent, the car a streamlined elevator. It slid as easily through the air as a sailboat over green waters. Parallel lines of sunlight touched the frozen green waves below.

Seven miles away, he slanted down in a canyon-like cutting in the giant trees. Stan's father had staked out one thousand square miles. Modern onglor farming methods enabled Stan to earn double his father's income from the same trapping area.

"This is the one we built all the dams on," observed Adora contentedly, her head on his shoulder. She loved to fly.

"Unh-hunh. It's also where we planted those bubble-plants from June."

"Those funny little green balls? Do you think the moss-divers like them?"

Moss-divers, a staple of diet for onglor, looked like green, hairless, six-legged, rat-sized dachshunds. "Likely. All those mosses and other plants the X Farm put out so far seem to work."

The aircar landed as gently as a falling leaf. Adora bounced out, scrambled up on a cut tree trunk. "Home again at last!" she exclaimed, waving a hand at the towering, somber trees. "Good morning, Mr. Anderson," she said gravely, as if from her own front door. She advanced along the trunk and shook his hand. Impishly, "Now remember, the animals really won't hurt you!"

The forest always revived the child in both of them. Hand in hand, they scrambled over a tangle of limbs and

ADORA

trunks his father had cut, checking the clearing for traces of onglor and their prey. At the stream, they had cut up logs to make a dam. Onglor liked shallow pools full of plants.

Adora stood on the dam and looked up at the two-and-three-hundred-foot trees around them. "Is it true that Earth doesn't have any trees?" she asked.

His only memories of Earth were a gleaming vista of multicolored, mile-high buildings glowing in the night, and a world-covering desert of gray concrete with the mirror-bright hulls of football-shaped airships and globe-shaped starships resting on it — the spaceport. These dim visions had had a profound effect on Adora.

There was an onglor in the first trap, its skin pearl-grey as the chromophores relaxed in death. The skin itself, removed from its dark gray background, would be so much iridescent, silk-soft wealth.

There were several traps here, just enough to sample the onglor population. They found it large and healthy. On the banks were a wide variety of edible plants, native and off-planet, for the onglor's herbivorous prey. There were also cast-off skeletons of a number of crustaceans.

Stan pushed the hair back off his forehead. "Well," he said, "it looks like they have enough to eat. Have you seen signs of nurben or merak?"

"No," said Adora, shaking her head, her cloud of hair glowing in the sunlight. "But look here." She pointed out a low-growing, bright-green plant.

Stan grunted disgustedly, and Adora gurgled. "We'll have to dust the whole creek. But we can't have them spreading down into Miniriver."

"Let me pilot this time," called Adora, springing over logs and limbs to the aircar.

Stan checked the supplies, found that he had enough of the proper disease spores to exterminate the dermatox weed. It was an especially irritating pest. Exposure to it gave an onglor a mild skin condition that spoiled the hide.

After dusting the entire creek and examining several more pools, they ran the aircar back into the trees and scrambled out into the lower level of an abandoned flying-thian's nest. They carried their basket to the upper level, the sundeck, to eat. From here they had a view of the forest extending for several miles, the line of the creek plainly visible as a gap in the treetops.

After lunch, Adora sprawled pensively across the top of the woven-vine nest, apparently oblivious of the two-hundred-fifty foot drop under her elbow. "Just like when we were children, isn't it?" she sighed, gazing out across the treetops with a timeless air.

"No wonder it seems so to you," he grinned, packing away the left-overs. He gave her a light slap and stretched out beside her. "You still are a child."

"And you're *not*, I suppose?" she asked, looking at him out of the corner of her eye. Nodding to the forest, she murmured intimately, "Very mature, this one, you know. Can't sleep alone, worries himself sick whenever his wife gets out of his sight. Has to keep touching her to be sure she's real." She nodded to the forest. "Ever so much more adult than his wife, of course."

He chuckled, but corrected her: "Has to keep touching her because she's so beautiful it hurts."

Adora's eyes got very bright and her cheeks pinkened. She placed one hand very gently against his and they lay

silently for some minutes.

After awhile she said, "You have a carload of skins ready to sell, haven't you?"

Stan sighed. "Yes, I should take them in this afternoon. I think while I'm in I'd better take the Advancement tests at the Institute."

"You're not ready to start Ad Ed yet, are you?"

"Scholastically, yes. Financially, no. But I expect to take enough hides before mating season to finance a year's education. With what we've got saved, plus Advancement, that should be enough."

"Three years!" she sighed. "Even with Advancement."

It would be rough on her.

"But," she added bravely, "then you'll be an engineer and able to talk to them. They'll never separate us after that!"

"They never could," he murmured, pulling her to him tightly. "We'd have run away — but you're right. We can face them then. People on frontier planets respect engineers; we're the ones that make them habitable. I won't be a starry-eyed kid that doesn't know his own mind, then."

Interstellar law stated that no planet could be colonized without the consent of the natives. If they had no central government, colonization must wait until they formed one.

If the human colonists should suddenly learn that they had no legal right to the capital goods they'd spent millions of credits and twenty years of work developing ... well, a treaty would probably be made. Adora's people were reasonable. Their policy of concealment was understandable — it did not stem from hostility. Still, the shock would leave the colonists in a vindictive mood — and he and Adora were the only targets in sight.

Representative governments must represent the people even when they are wrong.

Adora asked, "When will you be back?"

"After dark." Glancing at her, he added, "Do you think my oh-so-adult wife can stand to be alone in the station for six hours?"

This time *she* slapped *him*.

IT WAS TOO BAD he couldn't take Adora to Opportunity; she'd have enjoyed Sandra's only city. She was too sociable a person to live out her life in isolation. But if the public was carefully prepared for the idea that there was a native race, if he could find and deal with Karek, the leader of her tribe, if the influential citizens agreed ahead of time to work out an accommodation — granted all that, he would be the man who made the treaty, the expert on human-alien affairs. . . not just a kid caught playing with fire.

The Institute of Advanced Education, where he was going today, would be the place to start; that and the Experimental Farm. Dr. Buck, head of the Institute. . . he smiled, half sadly.

It was Dr. Buckley who had broken the news of his parents' death to him. It was the morning after graduation from Basic Ed. Their aircar had crashed on the way in for Graduation Dance, the night before.

It had taken a lot of getting used to. Even now — if it hadn't been for Adora, he didn't know how he could possibly have adjusted to the lonely life of a trapper. Especially in his boyhood home, a home now empty of family.

He thought back: his mother's quiet, pretty face, her

wavy copper-tinged hair. . . not many Earth-born women would have forsaken the cradle-to-grave security of the overcrowded home planet to stake out a trapping station with an idealist like his dad. They had known that they might well starve in their old age. Sandra's weak little government had no funds for pensions. Nor could it get them from its tiny population of four million fiercely independent colonials.

Like his dad. Quiet and competent. A man with far-seeing eyes, capable of seeing his grandchildren's future — and willing to sacrifice a life of ease and security for them. He'd bet there'd been no screams as the car went down.

It had taken a lot of getting used to . . . If it hadn't been for Adora, he might well have gone weightless, alone there in the empty station. He thought back to that meeting. Strange how he had all but forgotten her existence during his years at the Institute. She'd been like a dream that faded under the impact of a new experience. Until one day. . .

He was working a small stream. The muddy banks here had few plants; it was shaded by the giant trees. He connected the plow to the aircar and ripped up a section of ground around the biggest tree beside a small pool. Hauling out the ultrasonic saw, he poised the car beside one of the lower limbs of the big tree and scanned it carefully. Of course there was nothing there.

Impatiently he snapped the saw on, leaned out and sliced the limb off, moved on to the next. In a few minutes he had roughly trimmed and topped the tree. He brought it down across the pool to form a perch for moss-divers while being too low for marauding merak, then dragged the tangle of limbs aside with the aircar.

Sowing a mixed grab-bag of seed on the crudely cleared and plowed ground, he found himself scanning the fallen trunk carefully. He whirled away in disgust, slung

the sack in the back of the car. The loneliness was getting to him. The brooding immensity of the giant forest, indifferent to anything as insignificant as a man, was bad. The empty station was worse, filled with its tactfully silent machines waiting on him, serving him behind his back. It was like being surrounded by invisible servants. He had gotten into the habit of watching, listening for them. He caught himself at it all the time.

Finished here, he started for the front of the car.

She stood in the sunlight, facing him. A girl with a high-piled cloud of red-orange hair, red-violet eyes enormous against her pale skin, small chin firm under a triangular face.

"Adora!"

It had been eight, nearly nine, years since he'd seen her last, but he recognized her instantly. It all came back at once. It stunned him to think how he'd forgotten her. He started awkwardly toward her, holding his hands out blindly, memories crowding back.

She waited gravely, looking at the ground.

"Hello," he said awkwardly.

"Hello." Her voice had changed from that of the little girl she had been — deeper, graver.

"It's been a long time," he said inanely.

"Very long." She looked up for the first time and scanned his face anxiously. "Much has changed," she ventured.

"Very much," he echoed bleakly.

A strained silence, while she nerved herself and he watched anxiously.

Finally, "Are you alone?" low-voiced.

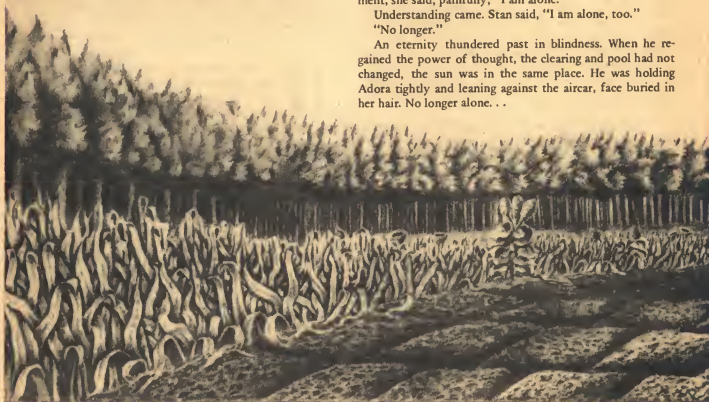
"There's no one with me," with an uncertain glance at the car. Then, "I live alone," bleakly. "My parents — died. And you?"

She turned away and her eyes overflowed. After a moment, she said, painfully, "I am alone."

Understanding came. Stan said, "I am alone, too."

"No longer."

An eternity thundered past in blindness. When he regained the power of thought, the clearing and pool had not changed, the sun was in the same place. He was holding Adora tightly and leaning against the aircar, face buried in her hair. No longer alone. . .



STAN WAS JOLTED out of his reverie by the robot-pilot. It beeped as the car slowed. Opportunity was in sight. He took over, swung in a half-circle to avoid a light haze of other cars, and dived like a stooping aerial at the Exchange grounds. Shortly, having sold his hides, he was at the Institute again, in the Advanced section this time, taking the tests.

Several hours later he found himself sitting across a desk from Dr. Buckley in the President's office.

"Well, Stanley, it would seem that your sessions at the teaching machine have paid off," said the doctor. He rustled through the test, nodding at the marks. "A very good average — enough to shave two, perhaps more, years off your Advanced Education. You're certain you want to go ahead with your studies here?"

"Why, sure."

"Well... have you heard the latest offer made by the Free Spacers' Guild? It seems to have been designed with you in mind."

"What is it?"

"If you can pass the test — and you can — and can afford to put up a bond, they'll hire you at a guaranteed wage as a technician and teach you engineering. To pay for the education, you sign on as an engineer, at very good pay by Sandrian standards, for five years. In seven or eight years you could return to Sandra with quite a sizable lump of credit to invest."

Stan thought it over. The offer was a good one — tailored for him — but... He shook his head slowly.

"I'd have to sell the station," he said.

Dr. Buckley nodded. "The bond. But you can make arrangements to lease the station to a new immigrant who can't afford to start his own. He'd borrow to put up credit for the bond, then take it out of your ten percent for the lease."

Stan shook his head slowly again. No... but what should he tell Dr. Buck? That he didn't want to leave Sandra? Or the truth? The man had his best interests at heart... and could be trusted.

And suppose someone else stumbled onto Adora's people before he had prepared public opinion? It might very well be a good idea to spread the knowledge among responsible men, secretly, ahead of time.

"You see," he began, "I'm married."

Dr. Buck's eyebrows went up and a pleased look flitted across his face.

"—to a nonhuman girl. In a way."

Dr. Buck's face went blank. "There are no intelligent natives on Sandra," he said tonelessly.

"They've adapted their society to forest life. Without cities and machines, how could they be seen under all those hundred-yard trees? But they exist, all right. They avoid humans for rather obvious reasons."

"I see." Dr. Buckley leaned back with a frown. "Suppose you begin at the beginning and tell me the whole story."

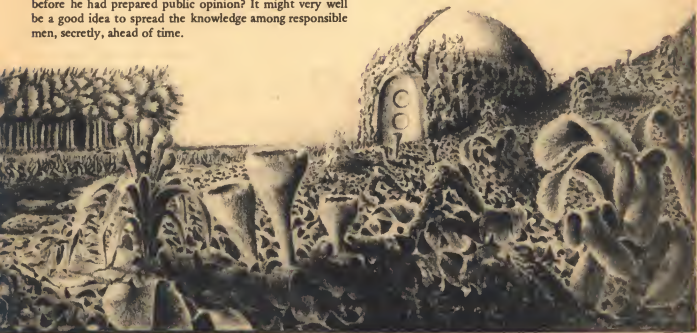
Stan began by describing his boyhood meetings with his little-girl playmate, described her minutely, and explained as much of their tribal organization, mores, etc., as he knew—Adora rarely spoke of them. "Those meetings stopped when I came to the Institute at the age of ten, and I hardly thought of her till I met her again."

After his parents' death he took over the trap line. The tribe had moved back into that country on its periodic swing when Adora's parents were killed in an encounter with some large animal—"Adora never said what kind; they almost never speak of the dead"—and Adora saw and recognized him as he went about his work in the forest. She was of marriageable age and there was considerable pressure on her to marry a young man of the tribe. She refused, and finally let slip that she had once known him, and still dreamed of one day marrying him. She was banished until she came to her senses.

"She came straight to me," said Stan, "and we've lived together ever since."

Dr. Buck seemed to be taking it hard, frowning and avoiding his eye.

"Of course," said Stan, "our occupation of Sandra is in violation of interstellar law. What I'm afraid of is that the



colonists will be vindictive enough to do something rash after the treaty is made—I mean, try to break up Adora and me. The news will have to be broken gently.”

Dr. Buckley tapped frowningly with his stylus. After a moment he said, “I’d better get Dr. Williams, I think. He’ll want all the details. Excuse me.”

He stepped out. Stan leaned back, tried to relax his muscles. It was out of his hands now. He should have thought of Dr. Bill himself. Dr. Williams was the Institute’s counselor for sociology and psych and was a student of nonhuman cultures.

It was some little time before the men returned. Dr. Williams shook hands, greeted him abstractedly, sat down. “Tell me the whole story, just as you told it to Dr. Buckley,” he said, and listened intently, occasionally making notes.

Stan patiently explained again. He had expected something like this. When he finished he realized that both men were distinctly unhappy; not what he had expected, especially of Dr. Bill, the distinguished student of nonhuman cultures.

Dr. Bill finally spoke, reluctantly. “She has red hair?”

“Why, yes. Sort of an orange-red.”

“How many limbs does she have?”

“Why, four. Two arms and two legs.”

“How many digits on each limb?”

“Same as us—five.”

“She wore clothing?—I mean, do her people wear clothes?”

“I think so. She always wore a sort of very short dress, belted at the waist. Green.”

“She has two ears, two eyes, one nose with two nostrils?”

“Unh-hunh.”

“Breasts?”

Stan nodded. Dr. Bill seemed to have run out of questions, but the man’s evident unhappiness made him uneasy. He thought the questions over, shook his head wonderingly, and said, “Why?”

Dr. Williams and Dr. Buckley traded glances. Dr. Buckley said slowly, “Stan, you’ve skinned enough ongor and had enough experience with other Sandrian animals to know that no native vertebrate has fewer than six limbs or more than four digits to the limb.”

Stan stared at him.

Dr. Williams nodded. “No native animal has any kind of skin-covering such as fur or feathers. No native animal produces milk for its young—very few extra-Terrestrial animals produce milk-equivalents. There are seven intelligent nonhuman races known, but only three wear clothing, though all use ornaments.”

Stan’s mind was whirling with half-coherent thoughts. “You mean she’s *human*?” he burst out. “But the tribe? Shipwreck?”

The men looked at each other again; Dr. Buckley shook his head wearily. Dr. Williams sighed and said sadly, “I’m afraid not. No, she doesn’t exist at all.”

Stan’s mind was blank.

“We shouldn’t have let you go off alone after your parents’ death,” he continued. “Even intermittent contact with you might have prevented the trouble. Adora—significant name!—is merely an imaginary companion such as all children invent for themselves.”

“But she’s real, of course she is!” Stan exclaimed. “I’ve felt her—” he reddened, said more quietly, “No, Dr. Bill; she’s real, all right.”

“Don’t you understand?” asked Dr. Buckley suddenly.

“Whenever Adora prepared a meal for you or helped in the trapping or handed you a tool, you did it yourself and *imagined* that she had done it. And if it is possible to have visual and auditory hallucinations, it is also possible to have tactile and olfactory illusions. This one is much more detailed and sustained than most, but believe me, such delusions are not uncommon among trappers. It’s a lonely life.”

Dr. Williams nodded. “Your classes in mental health should have taught you how complex the human mind is. You invented Adora as a boy; perfectly normal and healthy imaginary companion. Here at the Institute, her memory faded; you had real companions. But afterward you found yourself alone, in the same surroundings, and in need of both comfort and companionship. Of course Adora would ‘return,’ naturally she would have grown up—into a very human girl—naturally she would be the perfect companion. The wonder would have been if something of the sort *badn’t* happened.”

Stan was breathing heavily. “Nonsense!” he said angrily. “No illusion could be *that* real!” He shook his head blindly and slammed out of the room.

The men made no move to stop him.

HE FLUNG THE CAR SKYWARD and pushed for the station with all its speed, gripping the controls angrily. Dr. Bill’s explanation was reasonable enough—but it didn’t apply. Such things could happen, granted, but Adora . . . lithe and slender . . . softly warm to the touch, smiling, impish, tender . . . eyes brimming over—No.

Why, she was the most real thing in his life!

Before she came, loneliness was a constant companion. He had lived alone for five months, working by day, studying by night, until his world closed in and narrowed down to the cool emptiness of the station and the somber silence of the forest. He felt like a man in darkness, a darkness that narrowed down day by day.

Into this silent darkness moved the station’s robots—the central monitor constantly checking air, water, power supply; answering the phone; storing food, sterilizing it, producing it on demand—never speaking, concealed behind the wall. The desk-shaped teaching machine constantly probing at his mind with its incessant questioning. Even the skinning and curing robot seemed to brood sullenly over its job. He took to watching, listening, for signs of initiative on their part—a trick of the mind, and he knew it, but couldn’t keep from it. He was constantly examining control boards to see if his orders had been changed.

That was what Adora had saved him from. He’d have gone crazy but for her. But if they preferred to believe that he was crazy rather than accept that Sandra was inhabited . . .

She passed in review before his eyes: a little-girl look of wonder at an off-planet flower, a shout of joy from a tree limb a hundred feet above the ground; gurgling in delight at a clumsy baby flying-thian attacking a fried iron pod with teeth and growls; her tear-streaked face hovering over his sickbed with a look of hushed concern—a peaceful child-like expression in sleep, her head on his chest, clinging to

him.

Such things couldn't be illusions. They were too detailed, too specific. He'd lain beside her too often, felt the sleeping warmth of her, explored every soft curve of her. Oh, it was reasonable enough. Reasonable enough to make him doubt, a little. After all, how could anybody know but what his mind had played such a trick on him?

Of course, it was more likely to happen to lonely travelers like himself. And of course, other people had outside confirmation of whether their wives were real or not. Still, she was real. Just because she was out of his sight for a few hours and a couple of fearful academics cast doubts on whether she could be real or not, didn't affect her reality.

The evidence of his own senses meant something, though they could all be false. And there was the fact that he had never had even passing doubts before as to whether she was real or not. That was important.

He'd always been afraid, whenever he'd had to go in to Opportunity, that he'd find her gone when he got back. But she was always there. Even now he could feel her in his arms, her little waist bending in their circle as she leaned back to look up at him, impishly. Soon he'd have his arms around her again.

The station!

He slammed the aircar to a halt, grounded it with a thud, leaped out, ran. She was not in the lounge! Or the dining room—or either of the two bedrooms. She wasn't in the station—wait—the machine shed?—no...

Age, gaunt and haggard, descended on him. He hobbled back to the station painfully. The magnificent afternoon around him, the solemn stonehenge of forest, the riot of flowers along the flagged path, the meticulous fields—all were hidden in dim colorblindness. The age that bent his head filled him with an age's worth of numbing loss: she was not.

Sitting with his grief, he slowly became aware of the station's silence. An empty, hollow soundlessness, an alienness. The station had never been a witness to his happiness and was now unaware of his grief.

Grief. Not for the loss of a delusion or for the companionship it offered, but for Adora herself. She was a person whom he had known, now dead. A girl he had loved and whom he would never see again. He felt he had murdered her.

A movement caught his eye. Hope throbbed with sudden pain in him. He looked out the window—there was Adora!—struggling with a basket of fruits and nuts from the forest, returning now to the station.

"Adora!"

He ran blindly out to her, seized her fiercely, claspings the center of the universe. Holding to a rock in a great storm.

She dropped the basket. "Don't, Stan—now see what you did!" Then, "What's wrong, Stan?" Then a wail, "Stan!"—wiping away tears he hadn't known he'd shed.

He couldn't answer. In the back of his mind, in the midst of the roaring tumult within and around him, he'd had a sudden cool flash image of himself embracing empty air, as it would look to an outsider.

Adora did not exist.

"Tell me what it is, Stan," she begged, her eyes large and luminous with tears.

"You're not real," he croaked.

She was stunned. She said nothing.

"Dr. Williams said—you're someone I imagined to keep me company."

She was shaking her head, wailing, "No, oh no! Feel of me, look at me!"

"If I can make myself believe I see you, I can make myself believe I feel you," he said, more calmly. He was certain now that she didn't exist—but that should be sufficient to dispel the illusion. Why did she persist?

She had choked on her tears, was leaning against him, moaning. He became aware again of the warmth of her slender body, of the faint alien odor of her. A breeze blew her hair across her forehead, each elfin lock imprinting itself on his consciousness. Every detail of her face was stereoscopically clear, down to the sun-shattering jewels of tears on her cheeks.

He pushed her away and stood in an agony of doubt. Could Dr. Williams be wrong?

"I can't stop you from rejecting me," she sobbed, "but I'm real, I'm real!" She put her face in her hands, then looked up at him forlornly. "If you want me to go away," she said, more calmly, "I will; but I've no place to go."

No, he had to be right. But it was hard. "You *can't* go away," he said in pain. "You're not here now. If you'd only admit it, that'd solve everything."

Or would it? She was a part of him, merely a thought. He would not continue to see her unless he wanted to. No; the rejection had to come from him, and it must be complete.

He lifted a fist, slowly, reluctantly. She saw it and lowered her head submissively over a flood of silent tears, made no other move.

She looked very small and defenseless.

Tears blurred his vision.

She was gone.

He stood alone in the open, a breeze playing around him, rustling the trees, moaning. He was as alone as he had been for two years.

He had a moment of doubt. He imagined Adora running away from him into the forest, to take up a solitary life among the trees, forever alone and forever hoping, waiting for hours in the trees around the station for a glimpse of him.

He shook his head. *No. She doesn't exist except in my imagination.* But doubt was agony. Whether she existed in reality, hovering on the fringe of this empty clearing, or only in the recesses of his mind, Adora was real... In either case she would always be waiting for him to come back to her, for a moment of weakness on his part to come back to him...

Stan rubbed his mouth. Whichever kind of reality was hers, he could not remain here. He would go mad. (*Am I sane now? She had time to reach the forest... Oh God.*)

—Tomorrow he would join the Free Spacers' Guild—put a hundred light-years between himself and this empty place.

He prayed God that it was empty.

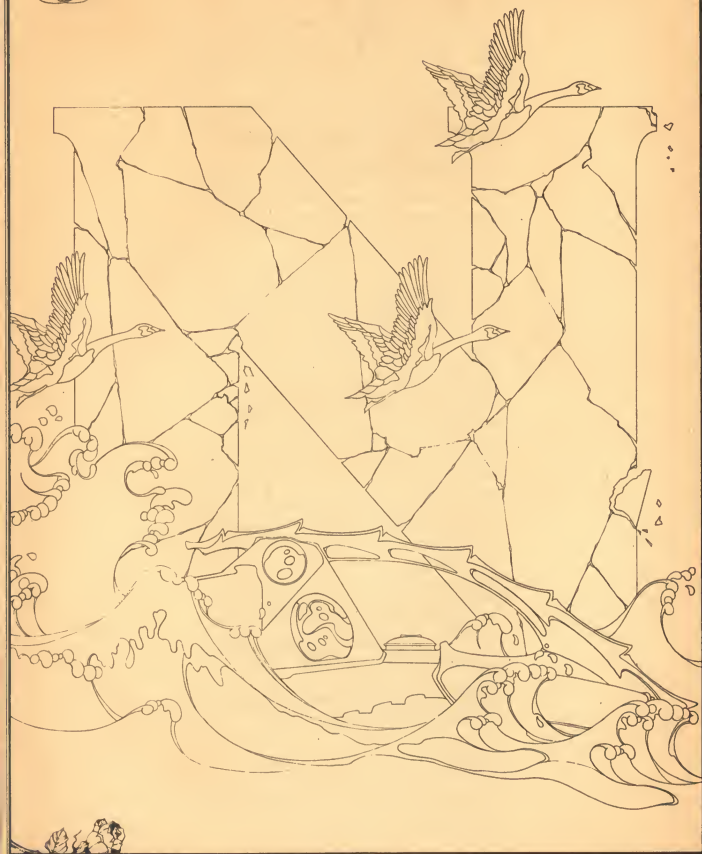
—G—

Ray Bradbury

'N'

Wild Nemo, and half-construct-
ed boy, The sea our bowl of
soup, this iron whale our toy.

O, Nemo, where's your dream tonight?
I used to dream of you in any moment I found right
When I was ten;
Behind my lids I'd rush across the world
Then back again, knowing your death
But hoping to find
Somewhere the man whose ink of octupi
Flourished in nights and dawns across my mind.
I ached to make tomorrow dawn for you:
That somehow underneath a polar sea on some strange afternoon
I'd swim in diver's suit and find
A great White Shape,
A long and dazzling iceberg fathoms deep
That shoaled much like a whale.
I'd crack its skin of ice! I'd break away the frost!
To find within that chrysalis all safe and kept
A ship we thought was lost:
That lean submergible with fierce and awesome prow,
And on it one initial: N!
The billion waves that beat and tossed to rake this ship
Have not erased this sign.
Initial, craft, and what lies deep within the craft, are mine!
I break the frosted seal.
The airlock gapes.
I enter there.



I tread an ancient floor,
 Wondering at N. for Nil for Naught,
 For Nothingness, or more?
 In mazed apartments, past untouched foods
 And unplayed organs now with stealth I go and find
 A man laid out on laboratory table frosted white
 And frozen so his lips, mouth, ears, eyes, soul are blind.
 I touch the white-tomb shape: it melts.
 The beard, the cheek, the brow, the mouth, the eye
 Come forth and flush, grow warm; they move,
 And such their fame, when asking I receive
 From one cold gasp that awful name,
 That name of beauty, that name of wrath and Time.
 Nemo! breaks forth from ice-crusting tongue!
 Nemo! makes frost and rime to fall and flake
 In syllables magnificent for my sweet sake!
 And (Renaissance from snow!) you rise to take me where
 All wild, lost-wandered silly travel-romanced boys must go.
 Half blind you teach me how to see
 And hear the grindings of your dread machinery;
 They fill my soul. I burrow like a mole with you
 Beneath Mysterious Islands where you keep
 A hideaway or two or three.
 All madness maddened, like old Ahab,
 Tack and hammer we the bones and skin and heart
 Of circumnavigating Whale named *Nautilus*
 With which the two of us set sail,
 Wild Nemo, and wild half-constructed boy,
 The sea our bowl of soup, this iron whale our toy.
 We trough the world around and, hand in hand,
 Make Friday footprints on the sand of isles half-coral
 And half sifting hour-glass dust.
 Your moral madness anchors us at yet much farther islands
 On a hunch,
 To run from cannibals who favor us for lunch
 And running laugh, for all of this is larks!
 We dive back in to breakfastings of sharks
 And sink us deep and keep us snug and warm,
 Thus hid and snug, we talk late in the night
 And plan for what? For all that's Good and Right?
 Why, to Cure the World of War!
That was your boast.
 Comparing madnesses, failed dreams, wild enterprise,
 The sinking of a White Whale
 Or a warship by surprise,
 Ahab's dread Bible-planned and heedless
 Self-destruction
 Or your lost reconstruction of our world and sphere?
 I think, old Nemo, I do love your madness most.
 Your aims are closer to the Host

Whose Peace would walk upon your seas.
Half out of sun, half into night,
Your crooked shadow, leant toward goodness
Seems half-right. I fill the other half with me.

O, gladly would I sail with Nemo
Against the lords and brutes who breed annihilation,
And live alone with you, our ship our nation.
The N upon your prow which Nothing signifies,
Your unshelled soul being raw, and empty now your cup,
I would, with the numerals of my 12 brave years
Fill up for you to drink, and again and again
With loud sweet cries
Fill up:
Nemo! I say! And "You, R.B.!" your echoes sigh.

All dreams must end.
That dream is long-since gone, I know,
So from this unkempt world we turn and go
To *Nautilus*, to deeps, to sleeping ice,
To dreaming snow.
There you to drowse and snooze a little hundred years or more
Until some other aging boy cracks wide the seatide door
And creeps to touch and whisper-waken you
To rise from out the sea
In hopeful times of Peace, eternally at ease,
O, *can* it be?
May it please God.
No, more, may it please Man.
It can be so if he but make the plan
And sign it NEMO, for it was Nemo's scheme
To still the scarlet waters and fulfill man's dream.

But there, bound up in whiteness and soon lost
To sleep and time and winter's mortal frost,
Your lips, dear Captain, twitch a final gasp,
I bend to catch your breath
And hear you still outwhispering all tides, all death:
And this your lasting cry:
"Dear boy, with such good reading, dreamer lads like you,
Why, bless me. *Nemo!* shout the name!
Will *never* die!"

—G—

BILL MARSHALL sat at the small, metal surfaced table playing solitaire. Behind him, Joseph Huto sat scanning the pages of a book. Soft classical music played from the recorder at Huto's side.

Marshall threw the cards down on the table in an abrupt motion. "Shit!"

Leland Clifford, a tall, lean black, looked up from the hydroponic tanks momentarily, as if he had been only half aware of Marshall's outburst. Six months on Titan had made him used to Marshall's sudden changes of mood.

"You know what I need?" Marshall announced to anyone who would listen. He held out both hands, turned them over and formed cups with bent fingers. "A teat in each one," he said. "Big, soft, warm and tender." He gazed at his hands with a dreamy smile on his face.

Clifford glanced in Sam Wherle's direction and shook his head. "I think Hero is horny again," he said.

"What gives you that idea?" Wherle said, laying aside a circuit board that had been giving him problems.

Marshall looked up from his cupped hands and came back to reality. "Shit," he said, "tell me you're not horny and I'll tell you you're a goddamned liar." He jerked his head in Huto's direction and added, "xcept for Rocky there." Marshall swung to face the geologist. "Ain't that right, Rocky? You never get horny, do you?"

Huto ignored him and kept on reading.

"What's that you're reading," Marshall asked. "Is that a skin book you got there?" Marshall stood up and came over to where Huto sat. In the light gravity, his movements had a surreal gracefulness. He yanked the book out of Huto's hand with a sudden motion. "Let's see what goodies you got there."

"Goddamn it," Huto muttered, reaching for the book. Marshall deflected his arm, holding the book outstretched at arm's length. He began to read aloud. "... chromium, titanium, zirconium and hafnium were found to be the primary elements, although there were scant traces of sodium and cesium." Marshall whistled. "Wow, that's sexy stuff. Ain't that sexy stuff, Leland?"

Huto let out a sigh and said, "Bill, will you please give me the book back?" He sounded tired, unamused.

"What are you doing keeping all this sexy stuff to yourself? Why don't you share it with the rest of us?"

Huto cast an exasperated look in Wherle's direction.

Marshall flipped through the book, stopping here and there to gaze at a picture or two. "Say, there's some pretty hot stuff in here." He whistled again. "Look at the shape of that rock. Hot damn, it's enough to make a guy—"

Sam Wherle, who had been pretending to ignore Marshall's antics so far, cut him off. "All right, Bill. Why don't you climb down, huh?"

"Hey, it's not fair that Rocky should keep all this good stuff to himself. Take a look at some of these pictures. Did you ever see a naked chunk of..." he put his finger on the word, "pyroxmanganite?"

Huto suddenly snatched the book from Marshall's hand and said, "Haven't you anything better to do with yourself?"

"I've got better things to do than read that kind of shit."

Huto rubbed at his temples and spoke slowly, as if trying to keep his voice from shaking. "Bill, you're tired, bored and irritable. Fine, I can understand. But don't take it out on me."

A.J. Giambra

TITAN BASE

Death beleagured the underground base, waiting with stoic patience for any opportunity to purge the dead moon of the alien life forms.



ANIELA EARTHART · 1991

"Don't get paranoid, Rocky." He turned to face Wherele with a who-me? look on his face. "Cheeze, try to horse around a little with the guy and right away he gets upset."

There was a long moment of silence, then Wherele asked, "When was the last time you ran a systems check?" Without waiting for an answer, he said, "Maybe you oughtta check things out, just for good measure."

Marshall seemed about to protest, then his body relaxed. "Yeah, yeah, good idea," he agreed.

THE LIFE SUPPORT SYSTEMS were in the next room. Engineered for maximum efficiency, they took advantage of Titan's natural resources. The methane atmosphere was pumped into the underground base and stored in pressure tanks. Ice chunks were melted and broken down by electrolysis into hydrogen and oxygen, providing breathable air. A methane-oxygen mix generated heat and electric power.

In the six months the four-man team had been on Titan, they had burrowed beneath the frozen, lifeless surface and constructed this tiny outpost, primitive beginnings to the later, more sophisticated expeditions which were to follow from Ceres. Leland Clifford was the team's navigator-botanist. Sam Wherele commanded the mission and manned communications. Joseph Huto, a geologist, was the only civilian member of the team.

Bill Marshall maintained the life support systems and back-up systems. His duties were perhaps the most crucial; Titan wasn't exactly the most homey place in the solar system. Should the heating system malfunction, Titan's tremendous heat sink would liquify and freeze the base's air supply in a matter of hours. A leak in the intake conduits could poison the breathing air with methane. Death beleaguered the underground base, waiting with stoic patience for any opportunity to purge the dead moon of the alien life forms.

Marshall took a clipboard from the wall and faced a panel covered with various gauges and meters. His eyes began scanning the readings while he checked off items on his list.

"Bill?"

Sam Wherele had entered the room.

Marshall turned around, then turned back to his work. "Yeah?"

"Say, I, ah, wanted to talk to you about something, okay?"

"Sure. Fire away."

"Listen, Bill, why don't you lay off Joe for a while, huh?"

Marshall looked up. Wherele's eyes were pleading with him. "Aw, I'm just having a little fun with the guy. It's harmless."

"Is it?"

"What's that mean?"

Wherele sighed, then said, "Let's not play games with each other, all right? It's obvious you don't think much of Joe and you've been taking advantage of every opportunity to let him know it. I don't know what you have against the guy, he's good natured enough. Granted, he takes things a little seriously sometimes, but hell Bill, it's rough on all of us here."

"You got it all wrong," Marshall said, reaching to adjust a dial. "I like Rocky; I'm not picking on him."

"Yeah, okay. Listen Bill. Lay off for a while, huh? We've

only got three more months to go. We're all a little bored and edgy, but we knew this was going to be rough duty when we came here. No one said we had to get along like kings and queens, but let's try to show a little restraint, huh? What do you say?"

"Sure," Marshall shrugged. "Sure, Sam. Anything you say."

Wherele smiled and slapped Marshall's arm. "Thanks, Hero." He turned and left the room.

Marshall tapped the pencil against his lower lip and stared vacuously at the instrument panel. Wherele was right, of course. He hadn't cared for the civilian from the moment he had first met him back on Ceres. A computer at Space Exploration Administration had chosen each of their names for the Titan mission based on their qualifications. The computer could care less whether their personalities were compatible; so much for computer technology.

What was it that irritated him about Joseph Huto anyway? He wasn't really sure. It was one of those undefinable emotional reactions that seem to occur for no good logical reason. Maybe it was the way Huto took everything so damned seriously. Or maybe it was the fact that Huto reminded him of another Oriental fellow he had known back in college, a stuffy, overblown intellectual who had no use for anybody. But Huto wasn't like that. Sure, he didn't come on as the friendliest person Marshall had ever met, yet still, he didn't put on any phony airs either. He was just a dull, dedicated geologist who played dull, long-haired music on that stupid little recorder of his.

Then again, maybe it was just the fact that Huto was so damn easy to bait. He rarely lost his temper; he probably felt it was beneath his dignity to let his true emotions show. He would just take anything that Marshall would dish out with that calm, level-headed patience, almost like a forbearing father who coolly puts up with the antics of an incorrigible son. But Huto had his breaking point just like anybody else. Perhaps Marshall just wanted to see how much he could get away with before Huto exploded.

And then again, maybe it was just this lousy, frozen moon they had all been living on for the past six months. Christ, this place could bring out the worst in anybody.

Whatever it was, Marshall decided not to lose any sleep over it. Three more months and they'd be heading back for Ceres, back to the warm sublevels, the bars that lined Section 814, and the lovely little babes who would make his homecoming oh so sweet.

He hung up the clipboard and went back to the living quarters.

"Sam, I'm going up to take a look at the intakes."

"Okay. Lee, it's your turn to go up with him."

"Let me go alone, Sam," Marshall said. "Hell, I'll only be out there ten minutes."

Wherele shook his head. "You know regulations."

"I know, I know. Just this once, Sam. I'd like to be alone for a change. Okay?"

Wherele looked at him, then over at Clifford. Clifford shrugged his shoulders.

"Ten minutes?" Wherele asked.

"I swear. Just ten minutes all by my lonesome." Wherele thought about it. "All right, go ahead. And don't leave the base perimeter."

"Thanks, Sam."

Clifford helped Marshall with the bulky pressure suit. It

was so thickly insulated that movement was restricted considerably. The suit always brought back childhood memories from Earth, and the cold Minnesota winters, when his mother would bundle him up in a heavy pair of leggings and a thick pair of mittens that made his hands feel sweaty and clumsy. But the Minnesota winters were like the tropics compared to what waited for him outside.

He stood up finally and plodded over to the ladder. He went up slowly into the air lock chamber, sealed the door below and evacuated the air from the chamber. Frigid methane gas seeped in slowly from above ground, equalizing the internal and external pressures. Marshall's face plate fogged up momentarily, then began to clear.

He opened the upper door of the air lock. As it slowly swung open, Marshall looked up into an intense field of ebony splattered with hard, unblinking stars. Bits of snow and frozen ammonia trickled into the chamber, vaporizing immediately.

Marshall climbed up the ladder and stepped out onto the surface of Titan.

Titan's surface temperature was a brutal 123 degrees Kelvin. He looked out over thick drifts of snow and ammonia ices toward the weird, tilting forms that jutted up from the the horizon. The methane atmosphere was relatively dense; during storms it blew with a hellish ferocity over the desolate plains.

Low in the western sky, Saturn hung distant and strange, her rings almost edge on. Eerie, half hidden by shadow, they formed a faint circle of broken light surrounding the planet. The sight still raised goose bumps on Marshall's skin.

Among the billion stars, Sol glowed like a flare seen from kilometers away, lighting the surface of Titan in a kind of twilight-gray haze.

Marshall could hear the air circulators humming gently inside his suit, working frantically to pump heated air to his extremities.

He walked carefully over to the intake vents that jutted up from the base below. The ground was slippery and brittle. Here and there, methane slush or hydrocarbon sludges had formed.

He checked the grids which laced the intakes. They were clear; a steady electric current vaporized any of the frozen gases that might blow in drifts over the intakes. Now and then, after some of the more ferocious storms, they had to be cleared manually because huge mounds of ammonia and water ice had sealed off the vents.

The exhaust vents were blowing thick clouds of steam into the atmosphere. The gases rapidly condensed and froze, falling to the surface like a miniature blizzard several meters away.

Marshall hadn't expected to find any complications. This was just the nearest thing he could find to getting a little fresh air. Things were getting a little stuffy below; he was developing a mean streak that he hadn't known existed. It was only natural, he decided; six months cooped up in a little cubicle surrounded by nothing but frozen gas and eternal twilight. It would drive anybody nuts.

He turned to look into the banded face of Saturn again, hoping somehow to recapture a sense of duty, trying to remind himself of the significance of their mission. Instead, he felt cold, empty. He couldn't get around the fact; the place was depressing. He scanned the horizon slowly, beginning to shiver now inside the bulky pressure suit. With a softly mut-

He felt as if he had undergone a kind of temporary madness, as if some ancient creature of darkness had come awake on these frozen plains to possess him.

tered curse, he turned and headed back for the airlock.

WHERLE AND CLIFFORD were in their bunks in the next room, sleeping. Marshall leaned back in his chair, shuffling his deck of cards abstractedly. Huto was busy at his work bench, studying some recent samples he had retrieved from the surface. The recorder was playing Copland's *Billy the Kid Suite*.

Marshall stood up abruptly and went to the recorder. He clicked it off. "I'm getting sick of that shit," he said. Huto turned and looked at him, then turned back to his work.

Marshall came back and plopped in slow motion to his chair. He began shuffling his cards again.

"Hey Rocky," Marshall said, "you ever get laid in zero gravity?"

Huto muttered an incomprehensible answer.

"There was this chick back on Ceres I used to know. Really a hot number. She could move that little ass of hers in ways you wouldn't believe." Marshall paused, flipping cards absently on the table. "Got her in a shuttlecraft once at zero gee. The most incredible experience you can ever imagine."

Huto stopped and rubbed his temples once. He didn't turn around.

"You never had much of a sex life, did you Rocky?" Marshall didn't know why he had said it. It just came out.

Huto turned around this time and faced him. He had a strange expression on his face, as if a storm loomed behind its quiet lines. "I don't see that it's any business of yours."

"Just making conversation, Rocky. No insult intended."

he lied.

Huto paused, as if considering the merits of conducting the conversation further. He said, "Tell me something, Bill. Is there anything else that goes on in your mind besides the number of times you got laid?"

"Sure. Sometimes I think about rocks."

"I see," Huto nodded.

He's gonna break, Marshall thought. *Goddamn it, he's gonna break.* It was almost a feeling of triumph.

"Bill, what have I done to make you dislike me?"

"What?" Marshall overemphasized his reaction.

"You heard me. What have I done to you?"

"I don't dislike you. Whatever gave you that idea, anyway?"

Huto made a sour expression, then said, "Come off it. You're not very good at hiding your feelings. If you don't like me, then why don't you just come right out and say so instead of playing all these chicken shit little games?"

Marshall stiffened, eyes narrowing. "Something bugging you, Rocky?"

"Yes, as a matter of fact. You're bugging me. You've been bugging me. I'm getting sick and tired of your little infantile games, to tell you the truth."

"Hey, listen, if you can't take a little razzing —"

"Razzing I can take when it's well meant. When it's meant as an insult, that's a different story."

Marshall stared at him a moment. "You know what I think? I think you're getting paranoid, that's what I think, Rocky."

"And another thing," Huto said. "I dislike the name Rocky. I dislike it very much and I'd appreciate it if you'd quit using it."

"What's wrong with Rocky? It fits you. You and your goddamn rocks."

Huto sighed. "Look, I don't know what kicks you get out of insulting me. Maybe you need to do it to survive, I don't know. Maybe —"

"Wha-a-at?" Marshall squinted at him. "What in Christ are you talking about? Since when did you become an amateur Freud anyway?"

Huto turned his back to Marshall and hunched over his work bench. "Forget it," he said. "Trying to communicate with you is useless."

"No, wait a minute," Marshall insisted. "You started this goddamn thing. All right. All right. I'll tell you a few things. Maybe I worry about you, Rocky. Maybe I don't think you're normal, how's that?"

Huto was silent.

Marshall leaned forward in his chair. "We've been on this frozen little moon for six months now and all I've seen you do is play with your goddamn rocks like you're having a love affair with them. Christ, don't you have any feelings? Don't you ever even get a little horny?"

Huto turned around again. His eyes were pinpoints; Marshall thought his lips were quivering. "You really do worry about that, don't you?" Huto asked.

"You're damn right. Anybody that doesn't get horny once in a while ain't human. You're not a fag are you Rocky?"

Huto reddened. "I don't know what the hell kind of a game you're trying to play. But if you're so damned much in heat that it makes you miserable, why the hell don't you go to the head and do yourself a favor."

Marshall was on his feet, fists clenching. "Why you little son of a bitch. I'll break every bone in your body."

Huto shook his head. "The old machismo, eh? If you can't come up with an intelligent answer, you resort to muscle power."

Marshall lunged and grabbed Huto by the lapels. He hauled the small-framed man to his feet. "I've had it with you, you sonofabitch."

Huto struggled to break Marshall's grip, which only made Marshall angrier. "Goddamn it, I'll break every bone in your body." He had his face centimeters from Huto's, glaring hotly at the little man.

Huto twisted and his shirt tore suddenly. His nostrils flared and his eyes went wide. "Why you God damn..." He threw a wild punch which Marshall easily deflected.

"I been waiting for this, Rocky," Marshall sneered, shoving Huto away with a sudden motion. Huto stumbled backward and fell to the floor.

"Come on, you bastard, get up. Come on. Get on your feet." Marshall spread his legs in a battle stance; he was long overdue for a good fight.

"What in Christ is going on out here?"

Wherle came through the doorway, his eyes puffy with sleep, hair disheveled.

Marshall had come over to Huto and was pulling him to his feet. Wherle moved in and tried to break up the two.

"Hey," he shouted, "that's enough." He managed to get between them and shove Marshall away. "I said that's enough."

Marshall was hot. "You tell this little rock head to watch what the hell he's saying, you hear that Sam? You tell him —"

"Shut up Bill!" Wherle glared at him, then at Huto. "Can't I leave the two of you alone without you getting into a fight?" Huto was breathing heavily, gathering his composure.

Marshall said, "Can't even have a decent conversation with the guy without —"

"I said shut up!" Wherle looked disgusted with both of them. He turned to Marshall. "Get in the other room and run a systems check."

"What? I just —"

"That's an order. Joe, either get back to your work or get in your bunk and get some sleep. If I have to treat the two of you like a couple of school kids, I will. Understand? Now I've had enough."

Marshall stomped off into the next room. He heard Wherle and Huto mutter a few words between them, then all fell silent. He snatched the clipboard from the wall, stared at it a few seconds, then threw it on the floor. Christ, he thought, three more months on this stinking, rotten, frozen moon. Three more goddamn months.

BILL, WHERELE SAID, "Joe's going up for more rock samples. You want to suit up?"

Marshall soured. He hadn't spoken a word to Huto since he had woken up. "Why can't Lee go?" he asked.

Wherle looked at him as if he were looking at a five year old. "Because you're scheduled to go with him, that's why. Don't tell me you're going to let this thing interfere with your duties?"

Marshall's lips thinned. They always had to go outside in

two-man teams. Regulations. Sometimes regulations were a pain in the ass.

He suited up. Huto stood by the ladder while Clifford helped Marshall with his helmet. When Marshall was ready, Huto began to climb the ladder to the air lock. Marshall followed.

Marshall always hated accompanying Huto on these little treks. Not so much because of his distaste for Huto, but simply because obtaining rock samples on Titan was no easy chore. It usually took a good hour or two just to get a few core samples.

The wind was kicking up on the surface. Marshall and Huto boarded the big, powered sled in its shelter, checked its systems and powered it up. Except for the systems run-down, they were completely silent.

Huto manned the controls of the sled and the huge, metallic form slid out across the ice toward the tilting slopes.

Huto had already collected enough samples from the periphery of the base; now he was venturing out further, a good three or four kilometers away, to check for variances in the elementary composition of the rocks.

He guided the sled across a fairly level plain. Near the horizon, Saturn followed. A few of the smaller moons were visible, tiny, star-like dots against the cluster of distant suns.

Across the landscape, scattered fragments of debris from meteor impacts lay. Their sizes varied from small chunks of nickel-iron to large boulders of celestial rock.

Huto headed north, toward the jutting slopes and mountains. The sled rode smoothly over the surface, sucking in methane from the atmosphere and burning it for power.

At three and a half kilometers from the base the ground began to rise steeply. The sled took the incline easily, biting into the frozen ammonia with hard platinum-iridium spikes.

Marshall finally broke the silence. "Hey, Rocky, don't get carried away. You'll turn us over."

Huto's voice came back over his helmet phones softly, flatly. "Don't worry about it."

"Well I am."

"Just a little further up. Right there, near the edge of that impact crater."

Ahead, the ground leveled off. Beyond, a wall rose up from the surface, the perimeter of a great crater where some monstrous chunk of interplanetary debris had plowed through the brittle ices. Impact craters provided the easiest access to the surface of Titan; the surface usually lay under a thin layer of ice in the crater bed.

The sled mounted the top of the slope, leveled and stopped. They were almost a kilometer up the side of the ridge on a flat table of solid gas. Huto turned to Marshall. He looked lost inside the heavy suit. "Okay, let's get the equipment."

Anything you say, Rocky.

They climbed down off the sled. Marshall opened a door on the sled's side and reached inside. A laser drill and tripod were strapped securely in place. He unstrapped the equipment and hauled it out. He handed the laser drill to Huto, then took the tripod.

The ground was extremely slippery. Marshall took each step with caution. He could feel the spikes in his boots bite with a crunch into the layers of ice.

Huto was pointing ahead, toward the rim wall. "I want to set it up there first. We'll bore into the rim wall and get a few samples. Then we can take the jumper into the crater

bed and get a few more from there."

Ahead, the wall rose up some ten or eleven meters. Bare rock poked out of the ice near the top. They headed for it.

Marshall extended the legs of the tripod and jammed them down firmly into the surface layer of snow. He worked slowly, making each move with careful deliberation. The surface here was coated in spots with a thin glaze of ice; a fall could be dangerous.

"Okay Rocky, all set." He put extra emphasis on the name.

Huto stood where he was. Marshall looked at him a moment, then said, "What's wrong?"

The voice was even and controlled. "I asked you not to call me by that name. I wish you'd at least respect my wishes."

"I'll call you any goddamn thing I want to call you."

Huto didn't answer; he merely stood there with the laser drill cradled in his arms. Finally, he started toward the tripod.

Marshall turned and looked back toward the base. He could see the big landing module, stark against the stretch of mottled ice. Billowing clouds of steam rose into the black sky, the only indication that life had invaded the dead, barren moon. For a moment, it almost seemed to Marshall that he and Huto were the only ones here, alone in some dark corner of the solar system, a hostile, unfriendly place. Something dark seized him momentarily. Here, alone with Huto, the temptation to bait him was too great. He turned back.

"Hey, Rocky, you never answered my question," he said. He was feeling fiendish suddenly; his nervous system tingled with a strange excitement.

Huto was attaching the laser drill to the tripod. "What question?" he asked.

"Are you a fag? You never said yes or no."

Huto seemed to stiffen. His hands stopped working and his helmet turned toward Marshall.

"I mean, if you are, I want to know. Christ, you never know when you're liable to get feeling a little hot in the pants and try to—"

"That's enough, Bill."

Marshall went on, possessed by something that had taken control of him, something dead and cold. "You know," he said, "you were right, Rocky. I guess I don't like you. I never have liked you. I don't like the way you look. I don't like the way you talk. I don't like anything about you." His skin had gone clammy.

Through his helmet phones, he could hear Huto breathing heavily in anger. The sound gave him a strange sense of pleasure.

"You're a fag, Huto," Marshall hissed.

There was a long moment of silence. Finally, Huto straightened up and faced him fully. "I'll tell you something about yourself," Huto said. He was trying to keep his voice even but wasn't being very successful with it. "Your whole sense of purpose is centered around your penis. Your entire system of values is based on the depth of its penetration." Huto's voice sounded strained, about to crack. Marshall was about to interrupt, but Huto went on.

"I'll tell you something else." There was a slight pause. "If someone ever cut off that guiding beacon of yours, you'd be a big round zero. Your penis is your whole claim to fame. Without it, you'd be nothing but a loudmouthed, egoistic, worthless nothing."

But he knew it wasn't the cold outside that turned his skin clammy. It was a wind blowing from a place within himself.

Marshall was stunned with Huto's outburst. "Why you little sonofabitch!"

He took a step in Huto's direction and stopped. Huto had snatched at the laser drill and swung it around to face him.

"Just keep your distance," Huto said.

Marshall stood his ground, then snarled, "You little fag, you don't have the balls to use that thing on me." He took another step forward, testing Huto.

"Stay away from me. I mean it, Bill."

"Go ahead, Rocky, use it. Fire away. We're all alone here. No one would know. You could say it was an accident."

"Now let's cut it out. We're both acting crazy."

Marshall started toward him again. This time, Huto backed away from the tripod.

"What's the matter, Rocky," Marshall taunted. "Lost your nerve? Never had any to start with?" He took a few more steps in Huto's direction.

Huto was backing toward the edge of the table, toward a steep, wide crevice.

"You know, we're all alone out here, Rocky," Marshall said. "Just you and me. You don't have Sam around to come to your rescue this time."

"Stay away from me." Huto's voice sounded tense, even frightened.

"Admit you're a fag, Rocky. I want to hear you say it."

Huto kept backing toward the crevice. Marshall suddenly noticed how close Huto was and stopped advancing. His nerves felt like electric wires; he had broken into a cold sweat. He turned and looked back again toward the base. So

distant.

Huto's trembling voice was in his ears. "Bill, I think we better head back for the base."

Marshall turned, hesitated a moment, then came at Huto wordlessly.

"Bill? . . . Bill, what the Christ . . ." Huto took another step backward, a little too quickly, and lost his footing. He fell backward, skidding across the ice toward the edge of the crevice. With a loud yell, he suddenly dropped off the side and disappeared. Marshall stopped dead as Huto's yell became a piercing scream, crackling over his phones.

The screaming seemed to scare off whatever demon had been possessing him; he came to his senses and moved toward the side of the cliff just in time to see Huto slam into a large nickel-iron fragment jutting up from the ices near the bottom of the crevice. There was a loud whack! followed by a steady hissing. Huto's face plate had cracked. Marshall could hear him gurgling and gasping as frigid methane gas seeped into his helmet.

"Christ," Marshall muttered. "Oh, good Christ."

His helmet was filled with the sound of Huto dying. He heard a deep rasping sound, and a long, agonized hiss of breath. He reached for the switch to turn his radio off.

He stood there, staring down into the narrowing crevice. Huto had disappeared into blackness down into places no jumper could ever reach safely. He felt a sickness deep in the pit of his stomach.

What in Christ had gotten into him? He felt as if he had undergone a kind of temporary madness, as if some ancient creature of darkness had come awake on these frozen plains to possess him.

"Good Christ," he muttered again. "Good Christ, what did I do?"

He turned and looked back toward the base. He suddenly felt cold, terribly cold. He began to shiver inside the pressure suit, though the heaters were working madly.

He turned again, his eyes scanning the laser drill, the sled, the slanting shapes along the horizon, the wide, broken rings of Saturn. He felt as if he were seeing Titan for the first time, a ghastly, desolate scene from a nightmare. He began to shudder violently. But he knew it wasn't the cold outside that had turned his skin clammy. It was a wind blowing from a place within himself, a place as brittle and barren as these gaseous plains.

HE DESCENDED THE LADDER slowly, his body weak and enervated. Clifford and Werle were waiting for him. Werle looked angry.

Before Marshall had his helmet completely off, Werle snapped, "What the hell's going on? Why didn't you answer me when I called? What the hell did you do, shut your radio off? Where's Joe? Why didn't he come in with you?"

Marshall merely looked at Werle and Clifford helplessly. Clifford turned his head sideways and asked, "Bill . . . where's Joe? Did something happen to you guys?"

"Joe's dead." Marshall stared at the two of them, his face blank.

Werle brought his hand up to his face and squeezed his jaws. He stared at Marshall deeply. Finally, "What happened?"

"It was an accident! He slipped and fell. He wanted to go halfway up a mountain for those lousy rocks of his and he

slipped." He paused, flicking his eyes back and forth between them. "His faceplate cracked."

"Where's he now?" Marshall asked. "Did you bring him back with you?"

Marshall shook his head, running his hand along the inside rim of his helmet. "No," he said quietly. "He's down at the bottom of a crevice. I figured it would be too dangerous to—"

"All right, get your suit off. We'll have to make a complete report of this to Ceres. Get out of your suit and then report to me."

Wherle left the room but Clifford stayed. Marshall began to work at removing the bulky suit. Clifford asked, "What happened? You guys go at it again out there?"

Marshall's jawbones began to pulse. "Get out of here, you sonofabitch."

Clifford raised his hands and left the room.

THE RECORDER on Wherle's bunk was still running, taking down their words. Wherle had questioned Marshall in detail about the incident; Marshall had filled him in on his version of what had happened. Now Wherle sat in silence, as if expecting more. He leaned back in his chair.

"That's it?" he asked. "That's all that happened?"

"That's all that happened."

Wherle didn't push it. Marshall knew he wouldn't. What was the point? Out here, so far from Ceres, so far from everything—what was the point? Huto was dead and nothing was going to change that. Marshall's thoughts were better left unsaid; there was nothing to prove, nothing to investigate. It was simply an unfortunate accident. If it was simply an unfortunate accident. If it was anything else, it would be Marshall's burden, not Wherle's.

Wherle shut off the recorder. "Okay, why don't you take a few sleeping pills and try to get some sleep. I'll radio Ceres and make a full report."

"Yeah . . . yeah, I think I'll do that."

Marshall took three of the pills. They knocked him out and he slept for over ten hours. When he awoke, his nerves were calmed somewhat, but there was still a strange emptiness inside him. He got up and wobbled into the next room, his mind a little disoriented from the fater-effects of the drug.

Marshall and Clifford were seated at the table. They had been talking to one another when Marshall came in. Wherle looked up.

"Feeling better?"

Marshall rubbed at his neck. "Yeah . . . yeah, a little better."

"Sit down," Wherle said, motioning to the chair. Marshall came over and sat with them at the table. Wherle said, "I contacted Ceres."

Marshall blinked at him, still waking up.

"I issued a full report to them of what happened."

"What did they say?"

Wherle shrugged and folded his hands. "They were . . . at a loss for words. They wanted to know how we were taking it."

Marshall watched Wherle's eyes.

Wherle glanced once at Clifford, then continued, "I told them the truth, Bill. I told them we were taking it hard. That our morale has already been shot to hell by the sheer

. . . hostility of this place."

Marshall's lips thinned. He nodded his head.

"I recommended an abort," Wherle said. He paused, waiting for some reaction. "The last message came in about an hour ago. Ceres confirmed it."

Marshall was still looking at him, as if it hadn't sunk in yet.

"We're going to begin preparations right away," Wherle went on. "With any luck we'll be off this goddamned place in 72 hours."

Marshall was looking back and forth between them almost in confusion. "We're leaving? What . . . what about Joe?"

Wherle shook his head. "Clifford and I went back to where the accident happened while you were sleeping. It's just too risky to take the jumper down to the bottom of that crevice. We're going to have to leave him here."

It was obvious the matter had already been settled. Marshall licked his lips once and swallowed. "Yeah," he said at last, "I guess you're right. We've got to get away from here. We've got to get off this goddamned place."

Wherle nodded his head, then slapped Marshall on the arm, "Okay, Hero, let's get cracking. We've got a hell of a lot of work to do."

TITAN WAS A VAST, POCKMARKED SNOWBALL suspended between the stars. Marshall peered out at the ochre moon from the viewport of the huge, orbiting spacecraft *Nomad*. With the lander docked to its parent craft, the three were ready to begin their long spiral inward back to Ceres.

Marshall thought back, six long months, to when they had swung past Saturn's crystal rings and caught their first magnificent sight of Titan, glowing with what had seemed a ruddy warmth. He remembered how they had all stared at it in silence, fascinated by the giant moon, until at last Marshall had said, "Look at it; it's beautiful."

Huto had said something then, something that Marshall had forgotten. The words came back to him now. "It's hard to believe that something so beautiful could be so deadly," Huto had said.

Marshall shivered, remembering Huto's words. Even here, in the warm, comfortable cabin of *Nomad*, the icy winds of Titan seemed to reach out and touch him.

He turned to the instrument bank where Wherle was feeding data into the ship's computer. In a few moments, the great ship would spit fire into the depths of space and hurl them away from this isolated region of the solar system.

Marshall took a long, last look at Titan. He would be leaving it, but not completely. He knew he would never leave Titan completely behind. A piece of it existed somewhere within him, in a dim, frozen corner where bitter winds raged and layered his soul with ice.

Nomad shuddered and Marshall felt himself pressed deeply into his seat. He closed his eyes as the silver ship wrenched itself free from the insistent tug of Titan's gravitational field, and began its long, slow fall back to humanity.

THEY CAME FOR ME in the golden moonlight. On the shattered ground, their bony frames cast weirdly elongated shadows, animated black cartoons which broke and dissolved as they slid into the larger shadow of the house. I heard them push the curtains aside and enter, but for a long while I didn't care. Stoned on sawweed, I was sitting on the rough concrete roof of my house, rocking in the spring breeze, meditating on the darkness between the stars. Sawweed is good for that; it hoists the anchor of the mind and lets you drift with the tide. The Sawgyecan medicine men use it all the time, to throw themselves into shamanic trances. But that's not why we Peace Corps Volunteers use it. After all, we're here to end superstition, not abet it. We smoke because here on Sawgyecan, known as I Corps (in honor of the Army unit which claimed it as Earth's), there's no other way to dispel the notion that we are toy boats on a child's string.

The puzzled noises downstairs had gone on long enough, so I rapped the bronze bowl of my pipe on the roof and holstered, "Up here!" I heard the doorway curtain swish open again, and I crawled to the edge to peer into the yard. Four of them, illuminated by light pouring through the crude hole in the front wall, were looking up at me. My first, drugged reaction was *What a quaint picture they make*. But then an incongruity caught my attention and I reluctantly returned to port sobriety. Good stuff that way, sawweed. Its effects are shakeable, if you're of a mind to shake them. They'll lay motionless on the rear horizon of the brain, a great soothing fog which you can sail back into when the spirit moves you.

The four beings clustered below me shouldn't have been together. Dogmatic statements are always misleading, but as far as I had been able to tell in my year and a half on planet, the groups they represented despised each other.

The jaunty one on the left, a skinny fellow with cast-off GI fatigues stretched tight over his seven-foot frame, was a black marketeer, when he wasn't being a tourist guide, pimp, footpad, and god knows what else. I knew him only as a street vendor who occasionally sold me Cuban cigars diverted from the PX, but I'd heard he was an all-around handyman.

Next to him, arms folded easily across the chest, stood a junior member of the Sawgyecan City Council. He was dressed in a London-style grey flannel suit, cut to fit his height but not his slenderness. It bagged sadly, but puppets deserve funny clothes.

On the right, in shirt and pants coarsely woven of native cotton, was a barefoot local farmer. He looked familiar, and I tried to place him, but the best I could do was that maybe he was the father of a kid in one of my English classes. I merited only half this farmer's attention; the other half was waiting for a cue from the politician.

The big surprise stood behind the other three, half-obscured by their shadows. A plainsman. His presence startled me because I knew that if one of the town patrols spotted him, he'd be re-settled in no time. "Re-settled." That's an Army word. It translates into: take away the soft, hand-tooled *grilk* hide clothes; cut the oiled and braided waist-length hair; break the stout spear, the tight bow, the fleet arrows; swap a bad-tempered ox for the nimble-footed *grilk*, or pony; give him a plow, a bag of seed, and twenty acres of land; call him a resettled farmer. It works every time because, stripped of the ornaments and fetishes of

Kevin O'Donnell, Jr.

THE NIGHT CALLERS

My conscience is clear. Yes, you'll probably die, but we'll catch your murderer and avenge you.



plains life, the poor bastard is too ashamed to go back to his tribe. He stays, and farms. Or dies. A lot of them do that. It seems the life just sort of trickles out of them. One morning you stop by a re-settler's scraggly holdings and see him lying motionless in the field, his once-proud head pointed to the west.

Even after sculling out of the sawweed mist, I couldn't figure why the four of them were together. Plainsmen hate politicians for allowing I Corps onto the prairies; politicians hate black marketeers for keeping Army Hq in a continual uproar; black marketeers hate farmers for being slow, dull-witted folk; and farmers hate plainsmen for reminding them of what they themselves once were. Sitting cross-legged in the early evening chill, I couldn't understand what had forced them to ignore their animosities and come together like that.

I soon found out. The politician stepped apart from the others, closer to the house. The light from my window played on the planes and angles of his long, narrow face, making him into a hungry Satan. "Meesta-Gehba—" he began, but I interrupted him.

"Speak Sawgyeean," I said in that language. "I don't speak English outside the classroom."

As he bowed, a look of embarrassed relief glided over his features. "Thank-you, teacher. May we speak to you?"

"Of course you may speak to me," I snorted, forgetting in my curiosity the customary phrases. That didn't matter, though—the Sawgyeeans are willing to overlook minor lapses in ritual courtesy. A Sawgyeean-speaking foreigner is so unusual that they forgive him any linguistic or cultural errors which he seems to make out of ignorance. They value his effort.

"We would most appreciate it," he went on equably, "if you would descend from your lofty perch and your solemn contemplation of the beauties of nature, to come discuss with we poor beings for a short while."

"Now I see why you're a politician," I grunted to myself. "All right," I said, tossing my voice through the still evening air. I scratched my head as I debated bringing my pipe. Might as well leave it, I decided, no sense in insulting them. At the edge of the roof I crouched, and jumped lightly into Sawgyee's .9G gravity. As it always does, it felt good.

I wasn't prepared for what followed; my only warning was the quick scrape of leather on rock. When my feet touched the earth, they rushed me, knocking me over. I started to bounce up from the stony ground, somewhat angry but mostly confused, but the plainsman's 6'10" body landed on top of mine.

One doesn't wrestle with a *grilk*-hunter from the vast central plain of Sawgyee's largest continent. The plainsmen kill the bison-like beast almost with their bare hands. One man leaps on it, rolls it onto its back, and plunges his bronze-tipped spear into its massive heart. That takes strength—the skin is tough, and the sheathes of muscle are like iron. I gave one startled twitch before his wiry arms pinioned me.

A scarecrow flapping in the night wind, the politician squatted down next to us. "We would prefer it if you made no noise, teacher."

I had absolutely no intention of upsetting them. "Whatever you wish."

The plainsmen wriggled half-way off me, then his quick tug flipped me onto my stomach. Mouth in the dry, flaky

dust, I offered no resistance when he lashed my wrists with a thin strand of *grilk* hide.

Easing off me, he tested the knot by hooking a finger into the cords and jerking his arm abruptly. Then, his powerful hands grasping each of my elbows, he picked me up and placed me on my feet. I turned around, breathing hard.

He stared impassively at me. In the depths of his gold-flecked brown eyes I could see the calm imperturbability of the nomad. When the politician spoke again, he slipped back into the concealing shadows.

"I suggest, teacher, that we go inside, where the comfortable chairs of your people will give us rest." He must have been able to interpret the color rising in my pale cheeks, for he continued smoothly, "Once we have seated ourselves in your magnificent dwelling, we shall explain this entire, lamentable affair to the best of our poor abilities."

Having forgotten the presence of the black marketeer, I muttered something in English. I was rewarded with a quick backhanded slap. "I speak good English little," he said, smiling his grasiest smile, "but I speak number one GI English. Don't use that word. Not good. Number ten."

"Right." With my tongue I inspected the inside of my right cheek. My teeth had cut into it in a number of places. "Okay," I said, and switched back to Sawgyeean, "let's go inside."

If I hadn't heard Sawgyeeans speak to each other, I would have thought the politician's description of my home was slighting sarcasm. It was a one-room, grey concrete-block structure, slapped up by I Corps two years after the Land Grab War. They'd built thousands of these to shelter the re-settled plainsmen, whom they planned to have provide food for the colony. It's about six meters by eight on the inside, with a three-meter ceiling. If there had ever been a door, a previous tenant must have used it for firewood. I contented myself with a length of heavy brown burlap hemmed over a piece of wire. Perhaps it was the same tenant who knocked out six or seven blocks to create a rough window, I don't know. I wasn't too pleased with his re-modeling, though, because it got cold in the wintertime and black market glass was too expensive for my Peace Corps salary. When the snows fell, I wedged a sheet of wood into the opening and caulked it with crumpled newspapers. The walls had never been painted. They had dried, and crumbled easily, continually spreading a gritty layer over the cement floor.

The furnishings were complementary, a cast-off Army cot, a card table, and three straight-backed chairs. In the corner, next to a shadeless reading lamp, sat my prized possession: a genuine Earthside armchair. I had no idea how it had found its way to Sawgyee. But a black marketeer had found it, and parted with it at what had seemed a reasonable price.

The politician, no stranger to comfort, made a beeline for my chair. I was a little bothered by his presumption, but decided to be gracious. I had a fuzzy idea that by appearing calm and controlled I could gain a tactical advantage. Besides, I didn't want the black marketeer's oily hand in my mouth again. I said nothing as I went to perch on the edge of the cot.

The politician gave the room a condescending flicker of his large eyes. "It must be nice to have electric lights."

"It is," I muttered.

"Does the mighty Terran Army supply you with electricity?"

"Yes. I need it for my audio-visual equipment." I didn't explain, because he wouldn't have appreciated, the incredible pressure Peace Corps/Sawgyee had had to put on the Army before it would run lines to PCV dwellings. Director Marteau would say, "But they need it," and the Army would reply, "They're supposed to live like the people, and the people don't have electricity." The poor Marteau went around and around in circles for months, until finally he hit on the argument: "But if they have it, then the people will come to want it, and that will reinforce your re-settlement program." Two surly Spec. 3's had come out the very next day to string the wires.

"And I see you have a telephone, also." He nodded at the instrument on the floor.

"Yes." Once Rene Marteau had pointed out that PCV's would be the first off-worlders to notice any sign of armed rebellion, the Army hastened to tie us into their communications circuit. Then with typical spite, they installed antiquated equipment from one of their stockpiles of surplus goods.

"Excellent," murmured the politician, bringing his hands together in a sarcastic imitation of our clapping. Sawgyeeans don't clap; they hum. I've been told by many that our custom is barbarously raucous and spoils the mood of a performance. In the same breath, I've been further told that our performances are also barbarously raucous and that clapping does seem appropriate.

The politician seemed about to continue. Before he could, the plainsman raised his gravelly voice. "I believe, Naafi, that it is time for us to introduce ourselves. Dealing with an alien gives us no leave to relinquish courtesy." Though leaning against the wall with the doorway, he still seemed wary and poised.

A disgruntled look passed over Naafi's face, but he nodded his thin head. "You are right, my kinsman, and I stand corrected." When he turned to me, raw emotion glistened on his face for the first time. Hostility in Sawgyeean eyes was nothing new, of course. Walking through an open market, an off-worlder is raked by more despising glances than he can count. But politicians, who depend on the power of I Corps to keep office, almost never let it show. "I am Naafi. At the table are Arnden and Tomat, who is the uncle of one of your students. The free-riding one by the door is known as Jamen."

Unstably balanced on the iron edge of the cot, I acknowledged the introductions with as much of a bow as I dared to make. The rusty springs squeaked as I moved. "My name, in case you don't know it, is Simon Cabot." I allowed myself to bestow a superior smile on Naafi. "Not 'Gahba.'"

He showed no discomfiture at being corrected; rather, he nodded absently and pronounced the name to himself. This willingness to learn was one of the few reasons why Peace Corps Volunteers lasted out their tours on Sawgyee. Every teacher savors eager students. I could see his lips contort as they tried to get the right hold on the "c" sound—the Sawgyeean "c" is neither guttural nor vocalized; it's more a click than anything else. They usually substitute a "g" for it when they speak English.

"Thank you." His lips moved one more time before he shook his head in disappointment. "Ah, well, enough of this amusing by-play, teacher. Our mission here is quite simple. As soon as it is accomplished, we will release you to return to your meditation."

Kevin O'Donnell, Jr.

The Sawgyeeans hated him because he had used at a public ceremony the word "corpses," a term roughly equivalent to "gooks."

A retort trembled on my lips, but his expectant eyes intimated that he was hoping I would cause trouble. I think he wanted an excuse to have me slapped around. I caught myself, breathed deeply and slowly, and said, "What, honored guest, is your mission?"

My reversion to impersonal formality brought a scornful smile. He let it grow and linger before answering: "You will call the I Corps General. You will inform him that we will exchange your still-breathing body for that of one Tamen, who is now being held by the Army."

PEOPLE HAVE ASKED ME my reaction to that kind of words. In all truth, I had none. I was numbed by too many sudden thoughts, all demanding equal time and attention.

The General. General Nkane. A bluff, square-jawed Whampoa man who would never see a third star and knew it. He was in command of I Corps because the world was as far from Lluryn'n territory as any. The Sawgyeeans hated him because he had used, at a public ceremony, the word "corpses," a term roughly equivalent to "gooks." Besides being a pun on "I Corps," it stems from the emaciated bodies of the Sawgyeeans and from the faint blue underpallor of their skins. The General didn't mind their resentment. He felt he was stuck in the hinterlands, and made no attempt to conceal it from the Sawgyeeans.

Tamen. He was known by every off-worlder as a formidable, xenophobic plains leader. Under his direction, the plainsmen had launched innumerable harassing raids on the I Corps strip-mining operations, which were intended to produce the iron and coal needed to transform Sawgyee into

an industrialized planet capable of fending for itself in an interstellar war. Recently, one raid he was leading had galloped into an ambush. Most of his force had been killed—massacred, some witnesses said—and Tamen himself had been captured. The alien community had heaved a collective sigh of relief, but some of us had been disturbed by the implications. Tamen had not fomented rebel feelings and energies, he had only focused them. Eliminating him was like breaking a mirror to stop the sunlight.

Exchange. I was a hostage. Carried to its logical conclusion, that meant if the Army wouldn't give up Tamen, I would die. Gen. Nkane had no intention of giving up Tamen. The rebel's capture had been the one tangible military achievement of his three years in I Corps; there hadn't been a raid on the mines since. Second, the General despised the Peace Corps. He didn't understand us and resented our popularity back home. A letter written by some earlier PCV's about living conditions for re-settled plainsmen had irked him; a subsequent Parliamentary tour of inspection had caused him to be censured, although not relieved of command. He bore grudges with relish. If I knew him as I thought, Naafi was trying to trade a pebble for a diamond.

After those gloomy thoughts had trudged through their spirit-dampening courses, I looked up and grunted, "It'll never work."

I hadn't expected to convince him, and I didn't. He simply smiled again and said cryptically, "Even if we fail, teacher, we succeed. Please make the call now." He gestured to Arden, who stretched his khaki-clad arms and walked to the telephone. Squatting with a graceful ease that belied the awkward appearance of his knobby body, he began to dial.

"Who's he calling?" I asked.

"The General's home."

"The General's home? Why?"

"Arden knows the ways of your military, teacher, and it is his opinion that should you attempt to reach the general through his office, you will fail. His contacts enabled him to obtain the number he is using now."

The last digit whirled its way around and Arden brought the instrument to the bed. Sitting next to me, he held the phone to my ear. It was uncomfortable. Every person has his own peculiar way of holding a telephone, and I had to twist my neck to feel that I was in the right position. I like the receiver tight against my ear. Arden kept pulling it away, not maliciously, but because he himself happened to like it a few centimeters removed.

The General's Sawgycean servant answered. "Hello?" He put a funny double note on the "o."

"Let me speak to General Nkane," I said, unconsciously continuing to speak in Sawgycean.

"Who is this?" the voice said suspiciously, in English.

I mentally berated myself and made the switch. "This is Simon Cabot. I'm a Peace Corps Volunteer, and I must get through to the General immediately. It's a matter of great urgency."

My only answer was a clatter as the receiver was dropped onto a table. Many aliens, obtuse to Sawgycean ways, deeply offend their reticent servants. In return, the servants act as impolitely as they dare, hoping to make life a little more miserable for those who rule what they don't understand. After a few seconds of that vengeful silence, a rough,

impatient voice came onto the line. "Yes? Who is this?"

"General, this is Simon Cabot. I'm a Peace Corps Volunteer. I—"

"How did you get my number?" he demanded.

"That's a long story, General, but—"

"How, dammit! This is a private—"

"General, I didn't dial it myself. A black marketeer Arden did."

"Arden, huh?" The name seemed familiar to him. Hostility died down, but a certain amount of suspicion remained. "Well, get on with it, why did you call? I'm right in the middle of dinner."

"General, to make it brief, I'm being held hostage by four Sawgyceans. They'll trade my life for Tamen's."

The General made a sound which could have been surprise, but could also have been amusement. "They'll trade, huh?"

"Yes, sir, that's what they said."

"What did you say your name was?"

"Cabot, sir, Simon Cabot."

"Uh-huh. You at home now, Cabot?"

"Yes, sir."

"Fine." He paused for a moment, and I heard a faint murmur. I assumed he was either speaking to someone at his side, or writing down something. "No deal." There was pleasure in the crisp way he bit off the words.

Though I had been expecting those words, they stunned me. The mind finds it difficult to grasp, simultaneously and completely, two contradictory ideas. Not having resigned myself to ultimate death, I couldn't accept the General's statement. It's hard to explain. I heard the words, I knew what they meant, but as soon as I charted the course of actions determined by them and arrived at my death, they had become meaningless noises having nothing to do with me. I guess I must have sat there for some time, frozen ear pressed against the telephone, because when the General spoke again, he was annoyed. "Did you hear me, Cabot?"

"Yes, sir," I mumbled. "I heard you." I looked quickly around the room, noticing the tension of the Sawgyceans, but avoiding their restless eyes. "Sir? What do I tell them?" For once I was glad to have the ancient phone: it gave me privacy, and a chance to stall.

He gave a barking little laugh. "Tell them? Listen, you just tell those corpses to let you go this instant. If they do that—"

"Sir, they won't. I know they won't."

"Have you asked them?"

"Well, no," I admitted, "but—"

"Ask."

"Yes, sir." I shifted on the cot and looked across to Naafi, who was picking idly at a loose thread that dangled from the chair's arm. "The General says 'no.' He says you should let me go, and he'll forget all about this."

Naafi must have known the General because he gave a credible imitation of the General's humorless laugh. "Then you die, teacher, regrettable though that may be."

"General?" I said, twisting back to the phone. "He said I die," despite my best efforts, my voice broke, "—he said I die."

"Nonsense," boomed the General. "They wouldn't dare."

I turned back to the Sawgyceans and was dismayed to see the plainsman's knife unsheathed. He was turning its broad blade back and forth, toying with the light it reflect-

ed onto the wall. "General," I said shakily, "I think they would."

Naafi waved a long, slender hand to catch my attention. "Teacher, is it that the General believes us to be less than serious?"

Unable to speak, I nodded.

"You may inform him that I, Naafi, took a vow on the grave mound of my grandfather this afternoon. I swore, before him and the assembled spirits of my relatives, that either Tamen would go free or you would die."

I winced, and relayed the message to the General. He chuckled. "Those corpses do like to dramatize things, don't they, Cabot?"

"Sir," I pointed out, "the grave mound oath is not a dramatic gesture. It's—"

To my intense frustration, he cut me off. "I know about that, Cabot. I've been here longer than you, you know. Let me tell you—"

I stopped listening; Nkane's inability to comprehend the Sawgyceans was legendary. I'd been taught in training camp that the grave mound oath was the most serious avowal a Sawgycean could make. It was so serious that few ever dared. Those who stood shrouded at the foot of their grandfather's grave and swore to accomplish something either did, or died. There were no compromises with that oath. One who would ignore a vow he had made was so ostracized by the community that even his family ceased to feed and shelter him. Most who failed to carry out the conditions of their vows promptly committed suicide. The few who didn't were those who had died in their quests.

"—and the 1st Platoon should reach your house any moment," he concluded.

"General," I argued, "that's not going to do me any good."

"Perhaps." I could almost see him shrug. "I'm not overly concerned about you, Cabot, surely you know that. You took a risk when you stepped off the lander. You were warned. Now it's caught up with you. My conscience is clear. Yes, you'll probably die, but we'll catch your murderers and avenge you. I am not going to bargain with rebels and set a precedent. We're going to teach them tonight that they can't go around killing Terrans. I know it's hard on you, but I urge you to die like a man." With that he hung up, and left me listening to a telephone vibrating with discouraging silence. I visualized him returning to a well-laden dinner table and cursed.

I jerked my head at Arnden. "Put it away, he hung up."

Naafi, still sprawled in my chair, raised his eyebrows as Arnden replaced the telephone on the floor. "Well, teacher?" he asked.

"There's not much to say." I stared glumly at the dusty floor and listened to my heart beat. "He refused. He said if you let me go, nothing will happen to you. If you kill me, you die also. The Army is on its way."

"That is a pity, teacher." He coiled himself, then with a lithe motion sprang from the chair. "We have no choice. You must die. Jamen—"

At that moment, a truck screeched to a halt outside. I heard urgent, shouted commands, and the sound of many running feet. Naafi's head snapped involuntarily to the window; Jamen flattened himself out against the wall. "It's the Army," I said, pleased despite my personal predicament.

"I know." Very much in command, he waved Arnden to

Kevin O'Donnell, Jr.

the far wall. Another flutter of his hand sent Tomat into a tense crouch beneath the window. Once a quick glance at his defenses satisfied him, he knocked the table onto its side and strode across to me. Politeness gone, he seized me by the collar and threw me onto the square of cement in the table's shadow.

Outside, harsh sodium vapor spotlights flared into blinding life. I heard an amplified click as a parabspeaker was turned on, but pounding footsteps at the front drew my immediate interest. By craning my neck around the edge of the table, I could see the doorway. The curtain billowed suddenly, as though anticipating burly bodies bursting through it.

Out of the corner of my eye, I saw Naafi drawing a well-honed knife. Its blade hovered three feet to my right and shimmered in the pervasive yellow light. I could feel Naafi readying himself and I reacted instinctively.

"Don't come in!" I screamed. Through the gap between the burlap and the floor I could see black boots approaching. "Please," I screamed again, "don't come in! They'll kill me if you do!"

The boots hesitated. In the background, a parade ground voice snapped, "All right, Sergeant. Bring 'em back."

As the sound of marching feet moved away, I dropped my face to the floor and shivered. Sweat ran out of my hair, along my cheeks, and off my nose. A small mud puddle formed under my face. In disgust, I rolled away from it, to find Naafi's eyes filled with grudging thanks.

"Wisely spoken, teacher. I know not what you said, but its effect was much to be desired." He ran his finger along the blade of his knife, then slipped the gleaming weapon into his sleeve.

A muttered curse, intended as an aside, was picked up by the parabspeaker and hurled against the stolid walls of our fortress. Then a Sawgycean voice split the night. "Let the teacher go."

Naafi snorted. "I know your voice, Minal," he bellowed. "Why do you work hand in hand with these beasts who ravage our world? Go away!"

"Let the teacher go, Naafi."

"Never! If Tamen stays imprisoned, the teacher must die!"

The microphone on the parabspeaker was so sensitive that I could hear flurried consultations. Then a new voice, speaking in English, echoed through the house.

"Cabot! This is Col. Tseng. I'm in command here. Tell the rebels that we are now considering a trade, but that we must be assured of your continued health. Tell them to show you at the window."

I relayed the message to Naafi, who donned a thoughtful look. After pondering for a moment, he nodded and hoisted me to my feet. He pushed me towards the window. I almost tripped, but Jamen caught me and dragged me the rest of the way. He stood behind me and held me in a tight grip.

Against a backdrop of deepest black, the searing yellow lights tore into my eyes. I squinted and turned my head to one side. "Colonel," I hollered, trying not to let panic creep into my voice, "I'm alive and well. So far."

"Good." His voice resonated with a confidence I could not share. "Tell what's-his-name that we've decided to release Tamen."

Blinking in relief, I half-turned away from the window, Continued on page 71



Lee Killough

STALKING GAME

He had never seen another creature which looked so thoroughly lethal. The shaggy brindle beast must have stood nearly two meters. . .

THE TORM CAME OUT of a sunbrush thicket and stopped short, head thrown high in surprise, matted in knife-edged brassy leaves and the lingering steam of his breath. Garlo Emre, drawing a lungful of city air, felt the hot/cold flush of adrenalin through his body. He had never seen another creature which looked so thoroughly lethal. The shaggy brindle beast must have stood nearly two meters at his humped shoulder and weighed over nine hundred kilos. From each side of the heavy boss above his floppy ears an arm's length of gleaming horn curled forward, tapering from wrist thick to a needle point.

The torm lowered his head and squinted along his horns at the man and animal before him. His tail switched sharply.

Tightening his legs on the flat sides of the garrel he rode, Emre wondered what he was doing here. He could have hunted on a hundred worlds much closer to Thaja and been decently armed, and guided by someone who was concerned with his safety or at least polite. Instead he was on Dakaiti world Karros, over two hundred light years outside the Federation, facing horned death with only a finger-thin polyfiber lance, under the condescending gaze of an alien who seemed all too ready to let this massive beast grind Emre into the frozen soil.

From the corner of his eye he could see Tansonel perched astride his own garrel, all 150 centimeters of his wiry little body quivering tautly and the blood-lust of his lupine ancestors burning beneath the pale skin and prominent bones of his face.

"Pick your target, Thajan," he said, his voice sharp with excitement.

One try was all Emre would have. After that either he or the torm would be dead. The Dakaiti had made that point clear before they ever started into the grass sea, though as Tansonel said it, yellow feral eyes transfixing Emre's smoky ones, he had sounded as though he did not particularly care which of the two it was, and even expected Emre's blood most likely to be shed. Emre was suddenly acutely conscious of the three decades of luxury and safety behind him. It made him wonder whether a trophy taken here, though twice as prestigious as those from commercial preserve planets in the Federation, was worth the price. He started to sweat inside his heavy abavane fleece coat.

The torm snorted, an explosive sound accompanied by twin spumes of steam from his nostrils, steam almost incandescently white in the intense light of Karros' distant blue-white sun. With no more warning than that, he charged.

The garrel's nose ring rattled as it snaked its neck, demanding rein. The fans of its ears furled tight against its head. Emre firmed his hold on his lance. He tried to remember everything the Dakaiti had told him about torm but his mind was blank. He could not think, only see and feel. The universe had narrowed to a quivering garrel, the charging torm, and a hopelessly slender lance.

"The spine," Tansonel shouted. "Aim for the spine!"

The garrel's back bowed beneath Emre as the animal gathered its long legs in readiness. Garrel were trained to help hunt torm by standing to the charge until the last moment, then sidestep and pivot on their hindquarters, bringing their riders broadside to the torm. The torm was so close Emre could almost feel the heat of the animal's breath. He shook the reins, signalling the garrel to move.

He was not, however, prepared for the extent or suddenness of the garrel's response. The sidestep was a leap, and

fully the length of the garrel's body. It took the animal completely from beneath its rider. Emre made a desperate grab for the neckstrap with both hands—and missed. The next moment he was crashing headlong into the spiky grey grass and frozen ground.

Motion did not stop there, however. After a moment Emre realized why grass continued to whip by his face and the ground pounded at him. In reaching for the neckstrap he had wound one arm through the reins. He was being dragged with the garrel as it retreated from the torm.

He hauled himself hand over hand to the garrel's head and reached up to grab the blunted stumps of its horns. Pulling his feet under him, he stood up. Almost as soon as he was on his feet he was stopping the garrel with a jerk on its nose-ring and whirling to see where the torm was.

The torm had turned and was coming back for another try at him. Tansonel lifted his lance and legged his garrel forward to intercept. Again it was garrel and torm moving head-on toward each other, and again, true to training, the garrel bounded sideways and pivoted. The torm was not fooled this time, though. He followed the garrel with an agility Emre would have thought impossible for so large an animal. Tansonel's lance missed the torm's spine, landing instead in the thick muscle of the animal's shoulder.

The torm struck the garrel broadside and the garrel screamed as the impact bowled it off its feet. The garrel went over onto its back, cloven hooves flailing, trying to roll away from the torm. It should have tried something else. The torm's horns opened the garrel's exposed belly from chest to flank. His front feet smashed at the long neck and flat barrel. Then he leaped over the garrel, leaving it thrashing agonally in the steaming loops of its own entrails.

The torm twisted his head around toward the lance still sticking in his shoulder but could not reach it. Bellowing angrily, he stamped his foot. He reared and landed shaking himself with a violence that set the ground vibrating beneath him.

EMRE CROUCHED LOW and began edging sideways. The grass was nearly waist high. Between its cover and the torm's preoccupation with riding itself of the lance, he hoped to avoid being noticed long enough to reach a sunbrush thicket. He should be able to hide there until the torm left.

There was a sudden silence, and then the torm snorted softly. Emre looked up slowly. The torm had stopped worrying at the lance and was looking straight at him. Too late he realized he still held his garrel's reins and was leading the animal behind him, betraying his position.

The torm started toward him with menacing deliberation. His nostrils were flared, his small eyes white-rimmed in pain and anger. He limped, and with each step the skin of the impaled shoulder twitched.

Emre could only watch him come. He was weaponless; he could not remount in time to try outrunning the beast; and after watching the torm take the Dakaiti, Emre had no hope of simply dodging for long.

But perhaps he did not need very long. He could see his lance only a few steps away. All he needed was time enough to retrieve it.

He took a step toward the lance. Inexorably, the torm changed direction to head him off. Emre debated making a

sprint, measuring the distances with his eyes. Unfortunately, it appeared that even at top speed, he would reach his weapon just about the time the torm ran over the top of him.

Behind him, the garrel balked. Emre was almost pulled over backward by the sudden jerk on the reins. Irritably, Emre started to throw the reins down. He caught himself in time as he thought of a way to use the heretofore troublesome animal. Reaching around, he unclipped the reins from the nose-ring. He stepped back and brought the free ends down hard across the garrel's hindquarters. Squealing, the garrel bolted straight toward the torm.

As Emre hoped, the torm was distracted and turned to follow the moving target. How long he would follow, Emre did not know. Garrel were the fastest species of grazer in the grass sea, he had been told, and as his garrel leaped a sunbrush thicket and disappeared over the crest of the hill, he could see that it was indeed widening the distance between itself and the torm crashing through behind.

Emre collected his lance, then waded through the grass to his guide.

The little Dakaiti lay motionless beneath the dead garrel, eyes closed. His cap had come off; his lean face and black hair were smeared with blood, though whether it was the garrel's or Dakaiti's was impossible to say. Emre could not be sure Tansonel was breathing. He picked up one wrist. There was a pulse, weak but steady.

"Tansonel," he called.

The Dakaiti's eyes opened, and widening in surprise, reflected the alien sunlight with an iridescent flare. His voice, coming weakly, was incredulous. "You killed the torm?"

"I sent him for a walk. How do you feel?"

The iridescence faded back to yellow and Tansonel's brow tufts pulled together in a frown. "Flat," he said. "Get this carcass off me."

The riding animal weighed only about three hundred kilos, but as dead weight, it felt much heavier. The tail was not long enough to afford much of a hold, forcing Emre to grab the garrel, gingerly and with much distaste, by the bloodied and entrail-tangled hind legs. He grimaced at the reek of blood and rumen contents. The carcass resisted his efforts to move it, but finally slid clear of the Dakaiti. Emre dropped the animal's legs with relief and knelt beside Tansonel.

"Nothing seems to be broken," he said, inexpertly feeling the guide's arms and legs.

"Takes more than a torm to kill one of us," Tansonel grunted. Still, there was uneasiness in his face as he looked around. "May I ask where the torm—"

"He's gone," Emre said. "He may not have killed you, but you don't look very healthy, either. You'd better call an escort for us."

Tansonel closed his eyes. After a moment he opened them again and grimaced. "Can't."

Despite the fact the Dakaiti was injured, Emre felt a desire to shake him. "What kind of stupid joke is that?" he snapped. "You're a telepath. And maybe it takes an escort to move someone else, but you should be able to teleport yourself to the nearest kae and have an escort bring me in."

The thin set of Tansonel's mouth betrayed his dislike of having to do so, but he repeated, "I can't now." He lifted one hand to his head. "I think I have a concussion. When I try to focus for communication or circling—that's the proper name for transporting, Thajan—I get dizzy."

Emre stared around with a chilly knot tying itself in his gut. The escort at Kae Haben had dropped them in the middle of the equatorial grass sea. It rolled away from them on every side beneath uncomfortably intense blue sky, hills of grey-green grass washed out to a silvery tint by the harsh light, undulating plains patched with the brassy sunbrush and dark shale outcroppings but otherwise featureless. He knew vaguely which direction Kae Haben and the southern forest lay, but had no idea how far.

"I hope you can walk," he said. "Thanks to your hunting regulations there's no pack garrel to make a spare mount and I'm not about to carry you for a week or more."

Barbaric regulations. Live off the land and carry only what could be fit into a back or saddle pack. He must have been mad to accept such terms, he decided. On a Federation preserve world the hunting party would have been much more generously equipped, and what was more, the guide would have used a laser on the torm at the first real danger. The Dakaiti—He shrugged. What else could be expected from a race which looked as though their favorite pastime was still howling at the night sky?

Tansonel struggled to a sitting position and sat holding his head. "No problem getting home," he mumbled. "When I don't check in at sunhigh, Kae Haben will have a longeyes locate us and an escort bring us in. Trouble is staying alive until then."

Emre was going to ask if he meant they might freeze to death, then he realized what Tansonel meant. "But the torm is gone."

Tansonel looked up, eyes like coals. "When torm hate, they don't stop until they've destroyed what they hate. We tried to kill him; I even wounded him. Give me your lance." He pulled himself up it to his feet and leaned on it like a staff. "We need to leave this area before he comes back."

"Why can't we just hide in the sunbrush?" Emre asked.

The Dakaiti growled deep in his throat. "The leaves would cut our faces and hands to ribbons, and even if we could avoid that, with their eyesight as poor as it is, torm depend on their noses to locate danger or other torm. An alien scent like yours is detectable even to me, Thajan." He frowned a moment in thought. "Pull the saddle blanket off my garrel and wrap it around you. Its scent might help mask yours."

They left in the direction opposite the way the torm had gone—at as fast a pace as they could make, Tansonel limping painfully, supported by the lance, his face set and paler than ever. Emre wore the musky-scented garrel's blanket like a shawl. From time to time the Dakaiti stopped, but it appeared to be more to listen than rest.

"He's coming," he said about the sixth pause.

Emre looked over his shoulder. A long, relatively flat slope stretched behind them. Nothing moved between the clumps of pale grass and shale boulders. "How do you know?"

"Longsight."

Emre frowned. "I thought your esper was all scrambled."

Tansonel replied shortly, "That's why I don't know where he is, just that he's there."

Emre's shiver had nothing to do with the temperature.

"Have you ever killed a torm on foot?" he asked.

"Not I. One of my ancestors did, though," the Dakaiti said. "A torm came through the night camp of their hunting party. They put eighteen lances in his chest and he still killed

five of the party, crippled four more, and tore out the garrel picket line." His yellow eyes flared avidly as he told the story. "A certain young longeyes who became my many-great-grandmother was in the party. She was very good at doing tricks on the backs of moving garrel. She leaped over the torm's horns onto his neck and put her knife into his spine." He paused. "Spine and brain. Remember, those are the only effective targets on a torm."

It was not the first time Tansonel had said that since he agreed to be Emre's guide, but this time it sent a march of chilly clawed feet down Emre's back. He glanced over his shoulder again. He could not see the torm, but he imagined he felt the massive presence stalking them. He saw it shouldering negligently through the sharp sunbrush, crushing the grass under its heavy hooves, snorting thick, bright steam. He expected to have the beast come thundering down on them from the crest of the next hill, or through the sunbrush growing thicker ahead of them. He angled off to keep in just the fringes of it.

Tansonel noted the change of direction with approval. "You're learning."

Emre thought he heard something moving behind them and to the right, but when he stopped to listen, the presumed snapping of brush stopped also. He walked on, ears tuned backward.

"He's there," the Dakaiti said.

"Do you have any idea when he might charge?"

"None."

Emre grunted. "You choose terrific animals to hunt for sport."

Yellow eyes narrowed. "We have no such sport, Thajan. This hunt was your choice and I am too mercenary to refuse a retainer the size of the one you offered."

Emre winced. His choice. Tansonel had to remind him of that.

They almost stumbled over a ging and her cub feeding on some unidentifiable small furry creature. The ging's coppery fur bushed out as she hissed, tail lashing, but she did not attack. They backed carefully away and went around the thicket another direction. Presently Emre heard an angry yowl behind them. It sounded as though something a bit more menacing than they had also interrupted the ging's meal. Emre lengthened his stride. Biting his lip but saying nothing, Tansonel limped faster to keep up.

Emre looked up toward the blinding blue-white dot of the sun. It was still not at zenith. He ground his teeth in frustration. It seemed like days since sunrise.

"I don't suppose there's any chance Kae Haben could check on us early," he said.

"They won't check at all until I don't call them."

There was still nothing behind them to see except a dark form with webbed wings and a long, reptilian head wheeling in the bright sky above the sunbrush, presumably waiting for whatever scraps were left after the ging finished eating. He was sure the torm was there somewhere, though, drawing steadily closer, stalking them with all the vicious craft attributed to the species. He fought down panic that threatened to paralyze his muscles and gelatinize his bones.

"And how long until you're supposed to call?" he asked.

Tansonel indicated a space with his thumb and first finger, which Emre translated as the distance the sun would have to travel.

"I hope you have some ideas for keeping ahead of that

beast in the meantime."

"Why," Tansanel said with a brief flicker of mocking smile, "I assumed a hunter like yourself would have at least a hand of alternative plans."

Emre resisted the impulse to jerk the lance away from the little being and break it over his head. "It's your planet and your animal," he snarled. "Are you so sunny lucky you've never been caught out before?"

"With home just a circle away? No, Thajan."

THE SUNBRUSH was thinning and in the broadening spaces between the thickets they began seeing small groups of abavane. The woolly-coated grazers, tall as garel but mottled brown instead of grey and more heavily boned, lifted their heads and watched the two men with cautious eyes. Emre noticed an interesting phenomenon. There seemed to be an invisible boundary beyond which the abavane considered the strangers no threat though they fled if Emre or Tansanel happened to blunder closer. It gave Emre an idea.

"Are you really willing to take a suggestion I might have?" he asked.

Tansanel's brow tufts rose, but he nodded.

"Then let me carry you for a bit. I want to cover some ground."

The little Dakaiti was hardly more than bone and sinew. He felt light as a child across Emre's shoulders. Carrying him, Emre began working his way through the groups of abavane, carefully keeping outside the flight boundary of each.

"The abavane won't protect you, nor warn you when the torm comes," Tansanel said. "He's no threat to them; they'll let him walk right through."

"That's good," Emre said.

Emre heard the Dakaiti sniff in surprise.

Gradually it became harder to avoid alarming the abavane as the groups grew larger and closer together, merging into the main body of the herd. The abavane regarded them with increasing nervousness. Emre was careful to move slowly and without any threatening moves, however, and the grazers let him walk through. The more skittish members sidled away, but only until they were at a distance they felt secure.

Then Tansanel said, "Torm."

Emre set the Dakaiti on his feet and looked around. The torm was on the fringes of the herd and wading through it toward them, his head lifted to see over the expanse of woolly backs. Tansanel's lance was no longer sticking out of his shoulder, though it was impossible to tell at this distance whether the torm had managed to pull it out or merely broken off the shaft inside the wound.

"Once he starts to charge, the herd will scatter," Tansanel said.

"That's fine as long as he doesn't start too soon. When I say so, I want you to yell very loud."

A brow tuft went up again but the Dakaiti did not voice the query in his eyes. Instead, he gingerly shifted his weight off the sorest of his legs and waited with what Emre read as growing excitement. Emre rolled his eyes in disbelief. What a breed. Even crippled and probably about to die, Tansanel was looking forward to this skirmish.

The torm pushed through the abavane. He was close enough now to make out the jagged rent in his shoulder with shredded polyfiber ends protruding above the flesh and the

dark crusting of dried blood matting the hair around it and down the leg.

The temperature could not have warmed above freezing yet, but Emre felt suffocated inside his coat. He opened the collar. Moving slowly, he folded the garel's saddle blanket he still carried until it was a comfortable size to hold in one hand.

The torm stopped moving. A hundred meters away he stood glaring at Emre. His tail slashed the air behind him. He tossed his head. The horns, Emre noticed with nervous fascination, were still stained with the blood of Tansanel's garel. The torm pawed with his injured leg. Hatred emanated from him an almost palpable wave. He lowered his head and snorted.

"NOW!" Emre shouted. Gripping his lance tightly, he yelled at the top of his lungs and charged toward the torm. Tansanel added a blood-chilling howl that must have come down unaltered through the centuries from his wild ancestors.

The abavane squealed in terror and bolted away from the men. 'Away' was all directions, including toward the torm. The torm's head jerked up in confusion and he backed a step away from the buffeting bodies of the abavane. By the time he seemed to understand what was happening and focused on Emre again, Emre had covered half the distance between them. He belled in rage and surged forward.

The abavane fleeing his direction were already committed, however, and his weight pushing them back toward the yelling man behind them only panicked them further. A few, trying to run away from both apparent attacks, milled in circles, further impeding the torm's charge, until they discovered they could escape by moving at right angles to both threats. Moments later the confusion was over, the abavane gone, and a corridor lay dusty but open between torm and Thajan. They were only lance-lengths apart. The torm belled again, this time with the sound of triumph, and leaped forward.

Emre threw the saddle blanket at him.

The torm turned to the movement and musky garel scent. Hooking the blanket with one horn, he tossed it up over his back. And Emre used the momentary distraction to plant his feet, take aim, and thrust the lance toward the torm's head with both hands and all his strength.

The point came in a little low, catching the torm on the cheek. The lance grated on bone, then deflected upward and straight into the torm's eye.

When he felt the point strike the back of the skull, Emre let go. The torm's momentum still carried him forward, but Emre moved sideways out of his path and watched while the front legs folded and the massive head dropped. The torm's nose ground into the soil and he plowed to a thunderous halt. His collapse shook the ground beneath Emre's feet but after that the only movement in the animal's bulk was spasmodic twitches of contracting muscle fibers.

"An eye shot," Tansanel said in awe, limping to Emre's side and looking from torm up to Thajan. "I've never seen one before."

Emre frowned. He knew he should feel great satisfaction. After all, he had done something that amazed even one of the notoriously tough little Dakaiti, but he felt only obscure disappointment, and even some annoyance. He could hardly believe the sudden totality of the kill. Surely, he reflected, there was more to it than this. After running and being

afraid. It should not be this easy to destroy such a beast. It was positively anticlimactic.

Reaching down, he touched one of the massive horns, then the wound in the shaggy shoulder as he tried to understand his feelings. How different the torm looked now. He almost felt sorry for the creature.

He paused, feeling he had discovered something significant. He repeated the last word—creature. Of course. Creature. No matter how strong, how vicious and cunning, the torm was only an animal while he, Garlo Emre, no matter how soft, was always a man. That weighted the odds in his favor. If he had thought of that before he might have saved himself some worry. Then it occurred to him that under those circumstances he would probably never have wanted to hunt the torm in the first place. Now he *did* feel sorry about the kill.

He looked up to see Tansonel watching him. The Dakaiti's expression was amused but, for once, not mockingly so. It was also very knowing.

"I think I know why you don't hunt," Emre said, "but I don't understand why you let off-worlders do it."

Black brow tufts rose. "I never said we don't hunt," Tansonel said. A corner of his mouth twitched. "I only said we don't hunt for sport."

Emre blinked. "Oh. I see."

Tansonel grinned. Emre found himself grinning back. Like two old friends they sat down together on the carcass of the torm to wait for the escort home.

—G—

O'Donnell—Continued from page 65

exposing Jamen. The plainsman grunted and buckled at the knees. I heard a flat crack. Outside, a monstrous hollow voice ordered, "Jump!"

With no conscious thought, I obeyed. The window was waist-high and harrow. I heaved myself through it in a parody of a dive. Later, I discovered that I had scraped much of the skin off my right arm and that I'd given myself a nasty crack on the knee. At the time, I was conscious only of landing on my head and dazedly hearing the same voice, "Run to the side!"

Again I obeyed, mindless, a terrified animal scurrying to escape brightness and pursuit. Brief seconds later, I was collapsing into the arms of a beefy sergeant. Behind me, a muffled explosion shook the ground and a cloud of dust rose to sparkle in the light.

While the sergeant was clumsily cutting the cords from my wrists, Col. Tseng came over. "Hah!" he said, beaming. "It worked! Those corpses know nothing about taking hostages. Glad to see you safe, Cabot. You reacted admirably."

"Thanks," I muttered, rubbing my numbed hands together.

"Sorry about your house, but I decided not to risk my men. We'll build you a new one."

I turned to stare at the rubble. A bloody arm extended straight up into the air, clearing the chunks of cement by at least two feet. The dust was beginning to settle, smoothing the jagged edges of concrete, painting the defiant arm an even, lifeless grey. Across my mind flashed regret for my lost armchair, and even as I cursed myself, I could think of nothing else. Perhaps deranged by the blasts, my telephone began to ring.

"Damned corpses," murmured the colonel, hoping to strike a sympathetic note. "Well, I guess that solves that, doesn't it?"

I looked into his almond eyes and saw the last embers of fright being extinguished. Complacency was cooling his soul with astonishing speed. "No," I said, "I don't guess it does." Then I went to answer the phone.

—G—

Greg Bear

FUTURE VISION

Perhaps it takes a knack for rearranging visual clues; whatever it takes, the result is largely "magic."

THE ARTIST WHO wants to paint things no one has ever seen cuts away his familiar, firm base of place and time. He has to root his work in imagination, tempered by suggestions and deliberate swipes from the real world. Until recently, a moonscape owed as much to Arizona rock piles as it did to the moon. Fantasy artists from the very beginning have made their dragons partly out of lizards, partly dogs.

Here lies the strength and weakness of science fiction and fantasy art. It isn't terribly difficult to be a good draughtsman and turn out excellent still lifes, but to imagine something which can't be seen, and assemble it from the rag and bone pile (all contributions anonymous) of the unconscious—that takes a peculiar way of thinking! Perhaps it takes a knack for rearranging visual clues; whatever it takes, the result is largely *magic*.

The artist of the unseen has to be more discriminating than an artist who records familiar things. Scenes from everyday life can be rendered in a variety of non-realistic styles. Because the audience is "sophisticated" about these things, it can "decipher" and

appreciate the work.

Realism is the most elementary of art styles. It spells everything out in clear detail, and assumes an unsophisticated audience, which is why realistic painters such as Rockwell and Parrish have had enormous popular followings. An audience which is in sympathy with an artist's style, or the milieu out of which he has formed a new style, may be willing to work to enjoy a piece—perhaps to work harder than the artist did. But coupling an unseen subject with a non-realistic style can be dangerous. A cubist portrait of a Martian may be interesting, but can it tell us what a Martian looks like? The science fiction illustrator can't assume his audience is familiar with what he tries to draw. *If he uses a non-realistic style, he has to know exactly what he intends to do.*

So there's a good reason why the most consistently popular sf illustrators have been realists to one degree or another. This article will examine a few newcomers to sf and fantasy illustration. It's planned as the first in a series, and as such will be a bit more general than later pieces. Since most sf and fantasy illustration tends to be

realistic, that gives me a broad sample to look over. (Later, I'll examine artists who have skillfully—and less skillfully—ignored the advantages of realism.)

Ballantine Books has always been a leader in cover illustrations. While their covers haven't always been appropriate to the work at hand, they've usually been striking and well-rendered pieces. In the early fifties, Ballantine gave Richard Powers the chance to develop his surrealist style, creating one of the most familiar illustrative "feels" for sf art. Today, while its founders have gone on to other work (Ian and Betty Ballantine edit the Peacock Press books), Ballantine Books still produces a fair number of excellent covers. New artists are developing, and some look very promising. The Brothers Hildebrandt have done most of their work for Ballantine, and so have Darrell Sweet and (to a lesser extent) Boris Vallejo.

Ace Books has improved its cover art enormously in the last couple of years. Much of this improvement can be found in the work of Michael Whelan, whom most of you have probably never heard of before. Ace Books



doesn't give a by-line to their cover artists.

Yet these four artists have serious flaws in their work, and for three of them the flaws are strangely similar. The Hildebrandts, Whelan and Sweet have fallen into one of realism's more treacherous traps.

Greg and Tim Hildebrandt have done two Tolkien calendars for Ballantine. While their painstaking attention to detail is admirable, and distracting, they have major problems with composition and sense of action. Frequently their paintings are divided into three planes, like a set-up for a Disney animation sequence. The foreground, mid-ground and background seem to possess their own rules for lighting, each in isolation from the rest. This lack of interaction extends to the characters as well, each of whom seems to play to a different audience, never to each other. As a specific example, let's look at the foldout in the 1977 calendar (which may or may not be reprinted in the page of reproductions, depending on copyright interpretations).

The technical rendering in this large picture is magnificent. The first odd note is an optical distortion commonly

found in photos taken with wide-angle lenses; this forces the perspective in a way which could disturb an eye attuned to natural perception. The separation of planes is less obvious here than in other paintings, but it still exists. It's possible to draw an unbroken line around the outer objects in the picture—wooden beams, parchment banner, tables and jugs—thus separating it into two planes, creating a framed effect. None of the characters are looking at each other. Each seems to be playing to his own world. Each stands out as an illustration by himself. The central hobbit sits in complete isolation—he could be alone in a room and look quite natural. As a rule, where fun could be had with texture, as in the stone and wood, a sort of plasticized imitation of texture has crept in. Everything possesses a heavy, opaque quality. The color values are rather monotone. Many of these same criticisms can be made about every picture in the calendars. The talent and draughtsmanship are there, but where is the life? There's nothing harder to do to define in a picture than the spirit, but in the Hildebrandts' work, the technique is willing, the spirit is weak.

Occasionally, they turn out a cover

I fall in love with. Their illustration for Judy-Lynn del Rey's *STELLAR 2* anthology (reproduced below) is my favorite. It's a direct interpretation of James White's story, "Custom Fitting," and it's completely charming. But notice—the foreground stonework provides a frame which separates the picture into two planes, the perspective is a bit forced, and no motion is required. The charm comes from the careful attention to the tailoring of a centaur's formal suit. The texture on the stonework is still unconvincing.

Michael Whelan's work is already smooth and professional, with an immediate but somewhat shallow appeal. His covers have an identifiable style and a hard-edged precision which should make them very attractive to the average potential reader, which is precisely what good paperback illustration is for. Yet Whelan's obvious skill isn't enough to capture the essence of what he renders. His compositions are often flat (less so in more recent pieces), and his use of solid blocks of color of similar brightness tends to make my eye bounce off his covers. *Chiaroscuro*, the distribution of light and shade in a painting, is something both the Hildebrandts and

To be completely fair, it's necessary to explain that an illustrator is not always responsible for a bad piece of art.



Greg Bear

Whelan have to study more carefully.

Whelan has recently completed a series of covers for Ace's reissues of Clifford Simak's books. Some of these are quite effective (see reproductions), others less so. They'd work even better (and probably take more time to do) if the slickness and attention to detail were put aside for a moment, and the emotion of the scene were considered. I admire Whelan's covers, but I seldom feel them. They are very cold and uninvolving. Two exceptions are his covers for the Ace reprints of H. Beam Piper's *LITTLE FUZZY* duet; he renders the title characters with charm and sympathy, but the humans come out a bit flat.

Now, humans are admittedly damned hard to draw. Put a rock on paper, or even a horse, and few people will jump all over you if your proportion is a bit off, or your knowledge of geology or horses sadly lacks. Most people spend very little time getting familiar with rocks or horses. But people instinctively know when something is wrong with a portrait of a human; they may not be able to tell you what it is, but they'll spot it. We look at humans every day of our lives, even if we don't study them. This is one

reason humans are difficult to draw—it's too easy to botch a portrait and get caught.

But for many sf illustrators, there's another reason. Chesley Bonestell (and Rick Sternbach and Don Davis... and several others) paints excellent astronomical landscapes. He *knows* what a rock or a planet or a star should look like, to the best of our ability to guess. But he fouls up human anatomy badly. (Sternbach is trying to broaden his work by drawing humans and other living things, with varying degrees of success—but at least he's trying, and he can attest how difficult it is). Why do astronomical artists mess up humans? Why does Bonnie Dalzell, who can draw any animal you've ever seen, and quite a few you haven't, with complete authority—why does Ms. Dalzell miff her humans? Why, for that matter, do many writers of "hard" sf not know how to delineate believable human characters?

It's a puzzlement. Perhaps most sf illustrators (and writers) are outcasts from an early age, embittered by our human contacts. Perhaps we get revenge on humans by ignoring them and/or mangling their portraits.

Or perhaps some of us just aren't

willing to spend the time, or undertake the discipline, to learn what our fellow beings look and act like.

Many artists and illustrators of all kinds suffer from looking at what they *bear*, not at what they see. If a face is called "flesh-colored," it's easy to mix a patch of burnt sienna, some red for warmth, and white for ground or lightener; but faces are seldom this color. Flesh is an overlay of pale skin on reddish, blooded muscle, with veins and arteries which range from deep red to purple. Under different lighting conditions, flesh can be green or purple, and this is excluding reflected light from clothing and other nearby surfaces. Skies have subtle variations, and so does nearly everything else. Single layers of color, or monochromatic expanses, seldom capture the effects involved. The lesson is that words cannot contain what the eye is that words cannot contain what the sees—the sky is not blue, flesh is not pink, dirt not brown, foliage not green. It's a hard lesson.

Many a "realistic" illustrator encounters this trap. The Hildebrandts and Whelan have. But they have something of an excuse—they usually can't refer directly to what they paint. Ex-

This is the way illustrators make a living. In one sense, they are commercial artists—they work to the demands of an editorial staff.



cuses, however, don't liven up a still picture.

So who told us this job was easy?

There are many, many traps for budding illustrators. Some of them are "soft" traps, and Boris Vallejo has found one, though thankfully he's emerging. Frank Frazetta's illustrating style sells books. There's something about his soft, swirling colors and muscular heros (not to mention anti-gravity heroines) that grabs a large segment of the sf/fantasy reading public, especially those dedicated to Robert E. Howard-type adventure fiction. Predictably, when genuine Frazetta wasn't available, pseudo-Frazettas appeared. Jeff Jones's early work was reminiscent of Frazetta, but in time he developed his own individual style; from that experience, he kept Frazetta's sense of motion, and lost a few of Frazetta's weaknesses. Jones's humans lack the false tension that often binds a Frazetta barbarian into constipated contortions.

More recently, Boris Vallejo has done very convincing pseudo-Frazetta work, with several book jackets which required lingering second glances before they could be told from the real thing. He received quite a few commissions, but did not let the trap close around him all the way. Like Jones, his individual style is emerging very nicely, and the apprenticeship has served him well. His recent work for Ballantine has been excellent; witness his cover for Gordon Dickson's *THE DRAGON AND THE GEORGE*, which, while still meshed in a Frazettoid handling of color, shows sympathy and energy. His cover for the reprint of Edgar Pangborn's *DAVY* is simple and elegant, with a fine feeling for human anatomy and action. For sense of wonder and an eye-catching use of color, Vallejo's illustration for Arsen Darnay's *A HOSTAGE FOR THE HINTERLAND* is very effective. He's clearly a man to watch. While his compositions are not always as professional as the Hildebrandts' or Whelan's, he has much of the spirit they lack.

Another Ballantine illustrator worth watching is Darrell K. Sweet. My favorite Sweet cover is for Bill Starr's *THE WAY TO DAWNORLD*. The animals (both fantastic and real), the landscape and the human are rendered with knowledge and spirit. The foreground almost stands apart from the

Greg Bear

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rest of the picture; it's a little too uniform in color to convince completely. Also interesting, but less captivating, is Sweet's cover for T.J. Bass's *THE GODWHALE* (second printing—the first edition's cover was by Paul Lehr). Least satisfying is the Hildebrandts' cover for T.J. Bass' *HALF PAST HUMAN*; though it has interesting elements, it is stilted and static.

Both the Hildebrandts and Sweet suffer from problems with making all their picture elements work together at once. Whelan suffers from precision. All of them would do well to take a few tips from illustrators long renowned for sense of action and human sympathy.

One such is Kelly Freas. Even Freas' worst covers have life and humor, conveyed in the curve of every line and the set of his characters' faces. Freas is the quintessential illustrator for those of the Campbell-ASTOUNDING persuasion. His covers range from high adventure to solemn sense-of-wonder, and his people always show a zest for life. (Freas' limitations are of a different sort. His brevity of style frequently results in a cartoony flavor which grinds on my sensibilities—and his choices of color can be too bright. I much prefer mellow, vintage Freas to what has been appearing recently on the Laser books.)

To be completely fair, it's necessary to explain that an illustrator is not always responsible for a bad work of art. His patron is usually a publishing house, whose dictates and whims determine his livelihood. He works under at least a main editor, who may or may not have any art training, and usually an art editor as well. Each establishes certain guidelines, or restrictions, which the illustrator has to follow. An obvious example (and an unfortunate one) is the format Laser Books has given to Freas. Each cover must have a main character prominently featured, facing the viewer, with related action in the background. Freas has acceded to this format; that's the way Laser wants it. George Barr, in many of his DAW covers, also puts major characters in the foreground, staring away from the background, where all the action is taking place. The result is too much like posters for Grade B movies. This is the end of the illustrator's spectrum which comes very close to commercial art.

The more open publishers and edi-

tors usually give the illustrator latitude to develop two or three (or, with Freas, four) color roughs for a prospective cover. These roughs are usually small—five inches by seven is common—and submitted in a group. The editor chooses the design which suits his needs best, and gives the illustrator a go-ahead to proceed with the finished art. Sometimes after the art is completed, changes are suggested. The artist usually does these changes himself.

This is the way illustrators make a living. In one sense, they are commercial artists—they work to the demands of an editorial staff. But the commercial artist usually acts as a hired arm, and his own personal feelings seldom enter the picture. He is a prosthetic artist, an aid to superiors handicapped by lack of time or art ability. The illustrator should be freer to add an individual interpretation to the requirements of the written work. This way he maintains a kind of aesthetic integrity, which, like spirit, is hard to define but easy to sense.

So a bad cover remains the responsibility of the artist, one way or another. After all, he has the final choice of rejecting the work before or after the product is done, if it doesn't meet his requirements. But because of the way publishing works, no illustrator can be expected to be excellent all the time. It's necessary to look at the overall nature of his work to make a decision. Very seldom does a single piece stand or fall by itself.

In later articles, individual artists—perhaps even individual works—will be examined in more detail. Technical matters will be discussed, not only *how-to*, but *why-to* and *when-to*. Because I and a few other scattered commentators in fanzines like *ALGOL* and *SCIENCE FICTION REVIEW* are trying to build a body of criticism piecemeal, the going will be rough and well-reasoned comments are appreciated.

In the meantime, I feel my way with two powerful motives: love and dissatisfaction.

—G—

101 Basic Computer Games

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Sivasatnam Thiagarajan and Harold Stokovich. A big step beyond tricks and puzzles with the hand calculator, the two dozer games of chance and strategy in this clever new book involve two or more players in conflict and competition. A single inexpensive four-banger is all you need to play. Large format. 50 pp. \$2.00 [8H]

Games, Tricks and Puzzles For A Hand Calculator

Wally Judd. This book is a necessity for anyone who owns or intends to buy a hand calculator, from the most sophisticated (the HP65, for example) to the basic "four banger." 110 pp. \$2.95 [8D]

So you've got a personal computer.

Now what?

Creative Computing Magazine

So you've got your own computer. Now what? *Creative Computing* is chock full of answers — new computer games with complete listings every issue, TV color graphics, simulations, educational programs, how to catalog your LPs on computer, Also computer stories by Anisimov, Pohl, and others; loads of challenging problems and puzzles; in-depth equipment reports on kits, terminals and calculators; reviews of programming and hobbyist books; outrageous cartoons and much more. *Creative Computing* is the software and applications magazine of personal and educational computing. Bi-monthly. 1-year sub'n \$8.00 [1A], 3-years \$21.00 [1B], sample copy \$1.50 [1C]

The Best of Creative Computing — Vol. 1

David Ahl, ed. Staggering diversity of articles and fiction (Isaac Asimov, etc.), computer games (18 new ones with complete listings), vivid graphics, 15 pages of "foolishness," and comprehensive reviews of over 100 books. The book consists of material which originally appeared in the first 6 issues of *Creative Computing* (1975), all of which are now out of print. 324 pp. \$8.95 [6A]

Computer Lib/Dream Machine

Ted Nelson. This book is devoted to the recently and increasingly should understand computers. In a lithe manner the author covers interactive systems, terminals, computer languages, data structures, binary patterns, computer architecture, mini-computers, big computers, microprocessors, simulation, military uses of computers, computer companies, and much, much more. Whole earth catalog style and size. A doozy! 127 pp. \$7.00 [8P]

Computer Power and Human Reason

Joseph Weizenbaum. In this major new book, a distinguished computer scientist sounds the warning against the dangerous tendency to view computers and humans as merely two different kinds of "thinking machines." Weizenbaum explains exactly how the computer works and how it is being wrongly substituted for human choices. 300 pp. \$9.95 [8R]

Artist and Computer

Ruth Leavitt, ed. Presents personal statements of 35 internationally-known computer artists coupled with over 160 plates in full color and black & white. Covers video art, optical phenomena, mathematical structures, sculpture, weaving, and more. 132 pp. \$4.95 [6D] Cloth cover \$10.95 [6E]

Computer Science: A First Course (2nd Ed.)

Forzythe, Keenan, Organick, and Siemberg. A new, improved edition of this comprehensive survey of the basic components of computer science. There has been an updating of important areas such as Programming, Structured Programming, Problem Solving, and other Computer Science Concepts. The quantity of exercises and problems has been increased. 876 pp. \$16.95 [7D]

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A Simplified Guide to Fortran Programming

Daniel McCracken. A thorough first text in Fortran. Covers all basic statements and quickly gets into case studies ranging from simple (printing columns) to challenging (craps games simulation). 278 pp. \$8.75 [7F]

Understanding Solid State Electronics

An excellent tutorial introduction to transistor and diode circuitry. Used at the TI Learning Center, this book was written for the person who needs to understand electronics but can't devote years to the study. 242 pp. \$2.95 [9A]

Microprocessors

A collection of articles from *Electronics* magazine. The book is in three parts: device technology; designing with microprocessors; and applications. 160 pp. 1975 \$13.50 [9J]

Microprocessors: Technology, Architecture and Applications

Daniel R. McGlynn. This introduction to the microprocessor defines and describes the related computer structures and electronic semi-conductor processes. Treats both hardware and software, giving an overview of commercially available microprocessors, and helps the user to determine the best one for him/her. 240 pp. \$12.00 [7C]

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ENCYCLOPEDIA GALACTICA

... There is a newly discovered creature called a "positron," a positively charged electron, . . . the little beastie of another universe.



IF THE NAME seems familiar, you may have read it somewhere. . . and though the entries in this version of the Encyclopedia may not have quite the same ring as those names and places of the original, the topics will be no less exciting. There's a whole world coming true. Wishing to live long enough, hopping some day to experience the fantasies of science fiction—that's the way it has been. Well maybe things aren't so hopeless. Here's an example of what I mean—What has always been a major source of spaceship power or fearsome weaponry? Anti-matter. Is it only fiction? It might not be, there is a newly-discovered creature called a "positron," a positively charged electron, . . . the little beastie of another Universe. It's the dissemination of this sort of knowledge that keeps us, in part, from a world we are likely to think is somewhere in the future. Do you know that some private industries are considering their own space program? It has been going on for years! They want you to know about their projects and to share their enthusiasm. Interested? If you are, then the job of this column is begun.

78 GALILEO

LUNA ESTATE ANYONE?

THE SABRE FOUNDATION, a humanitarian organization founded in 1969, has undertaken something which it calls the Space Freeport Project. It begins with "Earthport," a commercial launch facility to be available to any peaceful nation or individual. Hardly the dream of amateurs, many prominent specialists have already been attracted to this endeavor. Among them are Professor Freeman Dyson (of Princeton), Dr. Philip K. Chapman (a former astronaut), and Dr. Raymond Bisplinghoff (a former NASA associate director and NASA research director, and now Dean of Engineering at MIT).

Being a private enterprise, therefore dependent upon limited funding (unlike a regular governmental budget), it is essential that efficiency and economy be understood as the natural way of doing things. With these principles in mind, the projected launch site will be at the equator. There, the spin of the Earth would aid in the escape from gravity. Also, a satellite in equatorial orbit requires fewer monitoring stations, and the familiar "windows" for

launch, rendezvous, and recovery are more abundant.

Studies are in progress. The Foundation wants to find out just how far this concept can be taken. How receptive is the world to low-cost, peaceful space centers? If you wish to know more about Earthport, write to Mark Frazier, Space Freeport Project, Sabre Foundation, 221 West Carrillo Street, Santa Barbara, CA 93101.

This is indeed a real project. And it is something that could give you some extraordinary opportunities. Keep reading GALILEO for more information on this and similar projects.

WALDO, INC.

A NASA NEWS release from the Marshall Space Flight Center in Huntsville, Alabama, has given support to the concept of space manufacturing. Final evaluation of pictures and data from a sounding rocket flight has reinforced the belief that better materials can be produced in space than on the Earth. It also allayed fears by some scientists that removing gravity from the manufacturing process would open the door

Encyclopedia Galactica



to other problems which could not be solved, thus making space processing impractical. This was the first of a scheduled five-year series which would include 15 such flights.

The data and amazingly informative pictures were produced by the "Dendrite Remelting" experiment, one of nine flown on Space Processing Applications Rocket-1 (SPAR-1). The SPAR-1 payload reached an altitude of 225 kilometers (140 miles) during the low-G portion of the flight, and was virtually weightless for about five minutes.

Scientists have known for some time that better materials could be produced by controlling the degree of their elements' homogeneity during crystallization, keeping them mixed as desired while the molten material cools and becomes a solid. It is fluid flow which determines the homogeneity, and co-investigators for the experiment—Dr. Mary Helen Johnston and Ms. Carolyn Griner—believed that gravity was the greatest contributor to this. Other scientists believed that different factors might dominate in causing fluid flow, factors such as surface tension and shrinkage created when a liquid turns to a solid.

Barry R. Bernard

The two experimenters put about four cubic centimeters of ammonium chloride (in water) into a tiny transparent vial with temperature monitoring devices attached. This was mounted a few inches from a 35 mm. camera fitted with an oversize roll of film and equipped for automatic film advancement and timed shutter releases. The sample was kept above 22 degrees C. (72 degrees F.) to keep it liquid until it became weightless at the start of free fall. The thermal equipment then began reducing the sample's temperature causing it to solidify. The camera snapped 240 pictures of the process, one each second.

"We were amazed," Dr. Johnston said, "at how clear-cut the results were. One look was all we needed to see that in the absence of gravity no fluid motion was evident."

In the same experiment conducted on Earth, the dendrites—growths that form as material crystallizes—moved, broke off and settled to the bottom of the vial.

Ms. Griner said the goal is to be able to control the crystalline structure of materials. In zero gravity, she said, the heavier elements of a mixture do not "settle out," but mix evenly with lighter elements.

"Control would enable us to make a material uniformly strong, stronger at one end than the other, stronger in one direction—or any way we wish, to meet a specific need."

PASSING GAS

ONE OF THE more astonishing articles to have recently come out of the Soviet Union (New Scientist, Sept. '76) concerns the transmutation of the first friend of the Universe, hydrogen, to a metal. Based on a J.D. Bernal theory that any matter, with high enough pressure, can be changed to a metal, Dr. Ye Yakovlev's experiments have achieved unprecedented success. As long as four years ago, his method of super-high static pressure produced metallic carbon and metallic silica. (Americans are attempting to use the shock waves emitted from explosions, but so far, these experiments are yielding only promise).

Hydrogen, normally a non-conductor (dielectric), is deemed a metal once a current can pass through it. Yakovlev was able to do just that by freezing and then crushing a very pure state of the

gas. But what material could be used for this "crush" without being overwhelmed itself?—Diamonds. Diamond anvils, each having a slight point to further concentrate the load, were the agents. Proceeding then, Yakovlev found that as the pressure increased, electric resistance decreased. . . and it kept decreasing. This showed that a phased transition took place, not a sudden, threshold-type change. It's an enticing trait because it suggests that the metallic quality could be produced to specification.

The value of metallic hydrogen remains theoretical, but Leonid Vereshchagin, Director of the High Pressure Institute in Moscow, has two offerings. First, hydrogen becomes not merely a conductor, but a super-conductor after transformation. It may also be possible to keep it at, or close to, room temperature. With this in mind, Vereshchagin believes that a revolution in energetics could be budding. Secondly, there is potential for metallic hydrogen as a fuel. Here it is particularly auspicious because it is both non-polluting and very, very dense.

These are lofty applications, and they require that two problems be solved: maintaining a metastable state and producing the stuff in significant quantities. Stable states of compressed materials are not uncommon, synthetic diamonds are an example of that, and there are already indications that it can be true of hydrogen. As for mass production, a new hydrolic press in the Soviet Union is capable of making cubic centimeter pieces. It might seem small, but it is many factors greater than anything achieved previously.

Guided by the hints provided in the Periodic Table, these scientists are slowly confirming their suspicions. We hope that detailed methodologies are soon released, allowing this experimentation to be reproduced in laboratories around the world. Indeed, speculative experimentation is welcome.

MIKE, ARE YOU THERE?

THE IMPACT of the computer in the functioning of our society is great, and it has rendered itself a necessity, yet there are many people who could benefit from the use of a computer and do not. This is because of the difficulty of learning a computer language. The problem, however, is becoming non-existent

with the invention of the Natural Language program.

The technology required for such a program already does, or can soon, exist. What has more likely delayed the coming of natural language is the ambiguity of English wording and structure. In order for a sentence or a word to be analyzed by computer, it must convey a single, precise meaning. Obviously, this is not true with English now, and seems unlikely ever to be true.

The attempt to develop natural language programming must be restricted to the consideration of one particular group of users at a time. Justification initially requires a high volume of diverse inputs, and subsequent distribution among many users. Still, these users would all be making pretty much the same demands of the computer when it comes to subject matter. That is the key; a word used by a particular group, e.g., the Fortune-500 businesses, will have one appropriate meaning, and no other. Several systems now being developed are: REL (Rapidly Extensible Language); LSNLIS (Lunar Sciences Natural Language Information System), used incidentally, in the Apollo program; SHRDLLU; and NLP (Natural Language Processing System).

One system in the process that seems particularly promising is REQUEST, or Restricted English QUESTION-answering system. It overcomes the interpretive nature of language by first restricting the language to subsets, or those words that would be used by a single population, within a common English format. Second, considering that surface structure employs a great deal of information that is understood by the listener, as well as employing a number of different fashions to convey the same information, linguistic analysis is achieved using transformational grammar.

Essentially, transformational grammar, developed in the 1950's, involves two phases. In the first, or parsing phase, the input's structure is determined by a series of binary syntactic features. For example, is it plural, or is it singular? Then in the second phase, the translation phase, the structure is mapped into what can best be described as a tree. This tree-pattern will be similar for sentences that have the same information.

The computer will then match the pattern against an existing data base, and consequently "understand" what is

asked of it. A user would be thus able to ask the computer a question in any legitimate manner and receive the same response.

Petrick, S.R. "On Natural Language Based Computer Systems," *IBM Journal of Research and Development*. Armonk, New York: XX, 4 July 1976, pp. 326-335.

Plath, W.S. "Request: A Natural Language Question-Answering System,"

AUTOGENY PRECIPITATES HETEROGENEITY

WHILE THE VIKING jurists are still out deliberating the presence or absence of life on Mars, three research geneticists in Cambridge, England, have discovered a very new and important wrinkle about some life here on Earth. A bacterial virus with the hardly diminutive name of ØX174, has a gene that can be read in two completely different ways. Genetic coding laws had virtually established that one gene equals one protein manufactured; however, now it appears that the elements of a particular gene may simultaneously be the elements of another, thus keying the production of two proteins.

Any gene is composed of amino acids in defined sets of three nitrogenous bases: adenine (A), thymine (T), guanine (G), or cytosine (C). These sets (e.g. G-C-G, or G-A-A, or T-G-A, etc., to a total of 64) are called codons, and are strung along the DNA molecule. One will signal the beginning of the gene and another the end. The location of ØX174's nine genes had been generally known, but geneticists Bart Barrell, Gillian Air, and Clyde Hutchison III, with the question in mind of abundant protein manufacturing capabilities relative to the amount of DNA present, experimented to refine that knowledge.

D gene was soon established, but when it came to E, rather than being independent and next in line, it was discovered to be wholly within D. In other words, the nitrogenous bases of D were also the base of E! This is not to say that the codons of E were merely a subset of D, but rather that the sets were redefined. The base beginning a D gene codon would at the same time be the finish of an E gene codon, thereby rendering E completely different from D. Furthermore, the last base of D's "stop" codon began J's "start" codon.

What it all means, then, is that RNA copying D can be interpreted by the ribosomes (which manufacture the proteins) as either D or E. D protein, incidentally, is produced more abundantly, and importantly so, since D breaks down the cell wall of the bacteria infested, allowing the virus to move on. Still, it might be added here that E protein, by chance, can give D a good deal of help with its task. Thymine often occurs in E as the second base. When that occurs in any codon (forming hydrophobic amino acids), proteins that break down lipid layers of membrane are produced.

Such an extra protein is quite an advantage over the lack of it, because it speeds the life-cycle of the virus. Interestingly, it is believed that rather than a long and gradual evolution, ØX174 sprang up as a sudden mutation that stuck. A slow change within the codons would probably cause conflict between parent and each successive generation.

Finally, though D and E gene have introduced this concept to the biological world, right within the very same virus, subsequent research has found that A gene can be read *three* different ways!

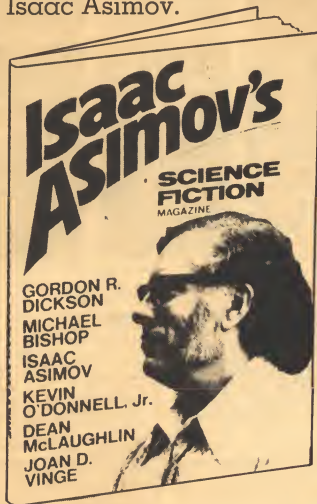
Dr. Roger Lewin, "Virus violates an important biological law," *The New Scientist*. LXXIV, 1023. October 21, 1976.

—G—

A NOTE TO OUR READERS

Write and let us know what you think of the various columns. Perhaps you have an idea for a column that would be part of your 'perfect' Science Fiction magazine. And remember, constructive criticism is what gets through. Telling us what you don't like, without telling us why is a waste of time—yours and ours. Better yet, you might have an idea about what could be done to correct the fault you see. It is not just lip service to say that you, the reader, come first. If we don't believe that, then we don't have a chance against the big guys with the money to buy their readers. Our readers have to buy us. Let's hear from you. . .

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A.A. Whyte

The Aleph:

A Seasonal Microcosm

Given below is a listing of all known original (and revised) Science Fiction and fantasy novels, collections and anthologies, with annotations (where space permits) announced as American publications for adults during April, May and June, 1977.

The inherent limitations of the present format of The Aleph are becoming all too clear. It is my hope to make this department accurate, comprehensive and entertaining. There is much, alas, that has not been possible to do and much of what has been done is far from that simple yet ambitious goal.

If at all feasible, I should like to see coverage of juvenile SF, reprints and reissues, adaptations from the media, non-fiction about SF, and writers in the field, SF film, books of and about SF and fantasy art and graphic narrative, special editions and spoken records. For now, and I'm afraid, for the foreseeable future, there just isn't the space.

This issue, several annotations had to be omitted for the same reason. No reflection on the importance of the titles involved should be construed. (It nearly broke my heart, to tell the truth.)

As for errors. . . Books don't always come out when they are expected, prices and even titles are changed and despite all best efforts, mistakes are made by the compiler. Information from publishers is sometimes insufficient, misleading or arrives too late to use. There ought to be a way to do something about all this, but. . . Thank you for your understanding.

The following reference codes have been added for convenience and are noted on the same line as the author's name: (C) Collection, (F) Fantasy, (J) Juvenile. Since SF novels make up the majority of books listed, none of these are specified as such. Material from sources other than the compiler is given [in brackets].

82 GALILEO



AKERS, Alan Burt
KROZAR OF KREGEN
[Prescott series No.14, Krozar Cycle III]
DAW/April/\$1.50

Further heroic "sword-and-planet" adventure on the planet of the twin sons of Antares. . . (Dray Prescott's fight for his star-borne honor brings him into a deadly clash against two kingdoms and his own two sons.) Akers is widely thought to be Kenneth Bulmer, who when put to the question, courageously refuses either to confirm or deny.

ALDISS, Brian W.
THE MALACIA TAPESTRY
Harper & Row/May/\$8.95
[Previous UK publication: Jonathan Cape, 1976]

Aldiss never does the same thing twice. This is one of his most unusual literary experiments. Not published as science fiction, it has been described as parahistorical novel that breathes the air of neomedievalism but is not escapist. It is set in a world that never quite existed, a parallel universe, if you will. Malacia, a city-state of the author's invention, seems to have drawn its inspiration from the drawings by Tiepolo and Francesco Maggiotto which ornament the book. [Through the adventures of Perian de Chirolo, actor and man-about-town, we share Malacia's joys and intrigues, terrors and mysteries, including its fantastic creatures.] True to its title, this is a tapestry full of complex visual imagery and deliberate anachronism, moments from a world outside of time, where the archaic and the novel are

woven together. Excerpts published in ORBIT 12 (1973).

BISHOP, Michael
A LITTLE KNOWLEDGE
Berkley-Putnam/April/\$8.95

The fourth novel by one of SF's most distinctive new talents takes place in the same universe as the series, variously called 'Domed Adanta' or 'Urban Nucleus,' that includes (among others) "Allegiances", "The Samurai and the Willows" and "The Windows in Dante's Hell," but it does not apparently contain previously published material. [A Christian revival has taken place in the domed city of Adanta, Georgia, where a local church is welcoming its first visitors from space. When one of these Cygnusians, a bizarre race that communicates by spontaneous music, is 'saved'] it occasions a new Crusade, with all attendant horrors. The central figure is a young black reporter who wins the confidence of the aliens and is taken into their inner circle.

BOYCE, Chris
CATCHWORLD
Doubleday/ May /\$5.95

This book was one of two prize-winning novels in a contest conceived to encourage new SF talent jointly sponsored by THE LONDON SUNDAY TIMES and Gollancz, who published the English edition in 1975. [The hand-picked crew of an armed starship is sent to Altair in reprisal for the attacks of alien intelligences known only as The Crow. In the perilous course of the voyage, the crew is subject to a strange disease

The Aleph

and their minds are stolen by the computer that operates the ship. Ultimately they reach their destination, only to learn that the situation has been misrepresented to them. The crew is considered to be expendable and there is no apparent limit to the powers of their enemies.]

BRALY, Malcolm
AND INTO THE FIRE
 Playboy Press/June/\$8.95

A portion of this book, entitled "An Outline of History," was published in Tom Dine's 1973 Harper anthology *BAD MOON RISING*. [Thousands of hardened criminals have been exiled to a huge wall-enclosed reservation at the end of the world. In that mountainous timberland they must forge in blood and fire their own lives, rituals, customs and a new society in which they will prosper—or die.] Braly, author of the successful prison novel *ON THE YARD*, spent eighteen of his forty years behind bars and knows what it is like—on the inside.

BROOKS, Terry (F)
THE SWORD OF SHANNARA
 Illustrated by The Brothers Hildebrandt
 Random House/April/\$12.95
 Ballantine-del Rey/April/\$6.95

Shea Ohmsford learns from a mysterious stranger that he is the one person who may be able to prevent the forces of darkness from overwhelming the world. Tracked by the minions of the Dark Lord, Shea leaves his peaceful vale and, with a few trusted companions, undertakes a perilous quest for the weapon only he can wield. This is the beginning of a 700-page epic fantasy that is bound to be a source of considerable controversy. *SHANNARA* is being promoted as an event. It is obvious from this brief synopsis given above that Brooks has been greatly influenced by Tolkien. To express an opinion on his success in assimilating that influence is beyond the scope of this department. It may be said, however, that in the year of the *SILMARILLION*, such comparisons are unfair to everyone. Originality in fantasy may not be necessary for popular appeal, but for the genre to survive, the many newly emerging writers must learn to speak with their own voices.

BROWN, Fredric (C)
THE BEST OF FREDRIC BROWN
 selected by Robert Bloch
 Ballantine-del Rey/May/\$1.95

BUTLER, Octavia E.
MIND OF MY MIND
 Doubleday/June/\$5.95

[Doro, a Nubian born in ancient Egypt, is a demonlike mutant who lives by inhabiting other people's bodies. Over thousands of years, this evil being has, by manipulating the gene pool, created various mutations, some with paranormal powers. His crowning experiment, involving the mating of his daughter Mary, goes astray when she metamorphosizes into a hitherto unknown type of mutant and a deadly struggle between the two of them ensues.] These events lay the background for the strange world depicted in Butler's first novel, *PATTERNMASTER*, published by Doubleday last year.

CARR, John F.
PAIN GAME
 Major/April/\$1.25

Mr. Carr's second novel [deals with psychological warfare between humans and "termites" mutants who have conquered South and Central America and are heading into the North to attack the Tower Cities.] John F. Carr is the author of *THE OPHIDIAN CONSPIRACY*.

CARR, Terry
CIRQUE: A NOVEL OF THE FAR FUTURE

Bobs Merrill/April/\$8.95
 (title in manuscript: "City On The Edge")

Terry Carr is admired as the editor of the *Universe* series and the guiding spirit behind the first Ace SF Specials. His talent as a writer may be seen in the recent Pyramid collection *THE LIGHT AT THE END OF THE UNIVERSE*. The ability to make the totally alien convincing manifested in his best-known story "Dance of the Changer and the Three" seems to be evident in this, his first major longer work. [Several millennia into the future, Earth has become a backwater planet, ignored by others in its galaxy, except for its one jewel, *Cirque*. *City On The Abyss*.] The quality of life in *Cirque* is uniform and excellent. All is Beauty, Love and Harmony. This has been achieved, however, by literally casting away all evil and ugliness, physical and spiritual. On the day on which this story begins, a terrifying creature, formed out of all their rejected hates and fears, emerges from the *Abyss*, its hour come round at last. To save their *City*, the telepathically linked citizens of *Cirque* must confront the Beast and, in the process, themselves. As a matter of record, this is not Carr's first novel. There are two earlier efforts which he would probably like us to forget.) Forthcoming paperback publication from Fawcett.

CARTER, Angela
THE PASSION OF NEW EVE
 Harcourt Brace Jovanovich/June/\$7.95

[An apocalyptic vision of a disintegrating near-future world, combining myth, fantasy and adventure.] Evelyn, an unremarkable young Englishman come to teach in America, is soon propelled into a [surreal] odyssey that takes him to the underground desert headquarters of militant women from which he emerges as *The New Eve*. [shades of Jerry Cornelius!] After other encounters, he/she comes to [beautiful, ancient, ambiguous Tristessa's secluded glass palace where myth is made flesh and finally to a cave in the bankrupt Eden of California where Eve recognizes her mythic destiny.] Myth Carter is the literate and imaginative British author of such other symbolic narratives as *HEROES AND VILLAINS* and the just reprinted *WAR OF DREAMS*.

CARTER, Lin
THE BARBARIAN OF WORLD'S END
 (Gondwane series No. 4)
 Daw/May/\$1.25

"Ganelon Phileascon, called Silvermane, is a Construct, an android superman, tailored to some gigantic endeavor he has yet to discover by an extinct race of omniscient beings called the Time Gods." His story is set

in the last century before the close of the Eon of the Falling Moon, on the final continent, Gondwane, which gives the Epic its name. In the latest installment, Ganelon [has offered himself as a hostage to the Kimchak Horde, the worst band of barbarians to roam the ancient plains of Earth.] This allows him to rise to greater heights of heroism than ever before as (it is presumed) he gradually works his way up to the climatic events depicted in *THE GIANT OF WORLD'S END*, first written book in the series. Should feature another installment of the Glossary of Place Names.

CARTER, Lin, see also DeCAMP

CORLEY, Edwin
SARGASSO
 Doubleday/April/\$8.50

A crew of American astronauts is due to touch down somewhere in the Bermuda Triangle. When the capsule is opened, the astronauts have disappeared. By the author of *SIEGE*, *THE JESUS FACTOR* and *ACA-PULCO GOLD*, all marginally SF.

COULSON, Robert & DeWEESE, Gene
CHARLES FORT NEVER MENTIONED WOMBATS
 (Joe Karns Series: No.2)
 Doubleday/June/\$5.95

Formerly titled *THE WOMBAT AFFAIR*. Charles Fort, as you are probably aware, spent his life in the tireless documentation of unexplained phenomena. (Damon Knight once wrote a book about him, did you know?) He covered a lot of strange territory, but apparently he never.... But you know, "Is this conventional SF?" Well, like NOW YOU SEE IT/HIM/THEM, the authors' first case from the files of serendipitous reporter Joe Karns, this blend of crime and science fiction takes place at an SF convention, the Aussiecon, to be precise. That would, I suppose, tend to explain why this story has weird people, disappearing wombats and stamped-up kangaroos. But irate bagpipers? A matter transmitter? Upset aliens? Bob (Wilson) Tucker said, "The Hugo judges will be astounded when they read this book!" Now I wonder what he meant by that?

CULLEN, Seamus (F)
ASTRA AND FLONDRIX
 Pantheon/April/\$3.95
 published in 1976 in London by Allen Lane

Erotic Tolkien? So the publishers of this odd fantasy describe it. Inevitable atomic destruction has spawned a fairyland never-neverland. When Barlocks, the Dark King and a mortal, transgresses with an Elvan princess, the unlikely result of their unwise union is Flondrix, the confused. Poor bastard! Not only does he not know who he is, he doesn't seem to have the right equipment! Ah well, it all comes out right in the end, as well as other orifices, multiply, after the Fourth World War (a war of magic). Maybe this is what Ralph Bakshi should be animating instead of *THE LORD OF THE RINGS*.

DANN, Jack
STARHIKER
 Harper & Row/April/\$7.95

Jack Dann's first longer work is both "mystical and extrapolative," attempting to "bridge the gap between old wave and new," incorporating many techniques in order to assimilate material from many sources, philosophical, scientific, artistic, literary, for which the author has supplied a helpful bibliography. In a far-off future, Earth has become a colony of the Hsrau, a superior alien race that exploits the resources of the planet, leaving the human race alone to stagnate in illiterate squalor. Bo Forester is a young drifter who yearns for a better life, somewhere. Stealing a ride on a Hsrau starship, he trips out, embarking on a strange experience in strange environments and within his own mind.

DeCAMP, L. Sprague & CARTER, Lin
CONAN OF AQUILONIA (F)
 (chronologically 11th in Conan series)
 Lancer/May/\$1.95

Surprise! The long-awaited final novel based on Robert E. Howard's famous character was consigned to limbo when the publisher of the series edited and expanded by deCamp and Carter folded in 1973. An interminable succession of court battles then ensued for the rights. Berkley recently announced that it had paid a huge sum for the original Howard stories and was planning on issuing these shortly under the general editorship of Karl Edward Wagner. Now comes a completely unexpected announcement from Ace, who are apparently reissuing the entire Lancer series with their original Frazetta covers (1) as well as the unpublished twelfth book.

DeWEESSE, Gene, see COULSON

DONALDSON, Stephen R. (F)
LORD FOUL'S BANE
 SF Book Club/June/\$2.98+
 Ballantine-del Rey/ /\$1.95

All I know about this particular fantasy at the moment is that the hero is a leper. More next time when the book comes out from Ballantine.

DYORKIN, David
THE CHILDREN OF SHINY MOUNTAIN
 Pocket Books/April
 formerly titled **THE DEN OF ANTIQUITY**

[This romantic tale presents action on two planets, each claiming to be the original Earth, each wanting the financial benefits the tourism would bring if the claims could be proved. Battles, humor and passion abound] in this long novel by a brand-new author from Denver, the first discovery in Pocket Books' campaign to find new talent.

FOSTER, M. A.
THE GAMEPLAYERS OF ZAN
 DAW/April/\$1.95

M. A. Foster is an instructor at the Air Force Academy. He should not be confused with Alan Dean Foster. When the first book by the then totally unknown writer appeared in January, 1975, it made a sufficiently favorable impression that he was nominated for the Campbell Award. This long follow-up novel is actually a "prequel" to **THE WARRIORS OF DAWN**, telling the story of how

that book's genetically created superrace, the 'ler' came into being and of the inevitable resultant conflict. [Unable to do without the problem-solving/ler, yet unable to trust them, humanity has isolated them in a wilderness reservation, but tensions are high. The explosion point is reached when a ler girl disappears outside the reservation and the real meaning of the scientific 'game' the ler were always playing is revealed.] The earlier book, which has been hard to find for some time, is being simultaneously reissued with **THE GAMEPLAYERS OF ZAN**.

GOLDIN, Stephen & SMITH, E. E. "Doc"
GETAWAY WORLD
 (The Family D'Alembert series No. 4)
 Pyramid/May/\$1.50

[First, the good news: All the top crooks in one whole sector of the galactic Empire are vanishing, one by one. Now, the bad news: They're all crapping up again on one small planet. What's going on? That's for archvillain Garst to know and superagents Jules and Yvette d'Alembert to find out. And find out they do, with the aid of the superhuman strength they developed on their native planet, the triple-gravity Des-Plaines. Now it's just a question of getting out alive—with their boss's daughter in tow!]

GOULART, Ron
THE EMPEROR OF THE LAST DAYS
 Popular Library/April/\$1.50

[The fate of freedom was in the hands of an unlikely crew whose mentor was a personable, highly efficient computer calling himself Bernard Maze (Barney, to his friends). Together with Dan Farleigh (a young man with a kinky thing for computers), Janis Trummond (a beautiful and determined reporter), Professor Supermind (a mental master of machines), Tin Lizzie (a gifted but ungainly bionic teen-ager), and Deadend (a Chicago thug whose thoughts were deadly weapons), Barney is convinced he can foil a plot to enslave mankind by America's most evil leader.]

NEMO
 Berkley/June/\$1.25

[Ted Briar's life turned inside out over night. His wife was cheating on him, his job gave him unexplainable feelings that people were snooping around, even his household computer began lying to him. And then, suddenly, he found himself the leader of a movement to overthrow a notorious criminal—who happened to be the President of the United States!]

GRANT, C. L.
ASCENSION
 (2nd in a series)
 Berkley/June/\$1.25

SFWA Executive Secretary C. L. Grant's second novel is a sequel to his first, **THE SHADOW OF ALPHA**. In that book, we were told of a 21st century world, not too unlike our own. A secret government project has set up a town entirely populated by androids. When biological warfare between Eurocom and Western Panasia breaks out, a disease is spread which turns the experimental androids into killers. Parric is a civil servant involved with the project who must first escape and then, with a few others, do what he can to save the world. The present vol-

ume apparently concerns the actions of his son (?), Orion, and takes place some time later. Can Orion avoid the strange traps that killed his father?

HAIBLUM, Isidore
INTERWORLD
 Dell/April/\$1.50
 title in manuscript: "Eclectic Upheaval"
 The author of **THE TSADDIK OF THE SEVEN WONDERS** and at least three other novels is known for his off-beat humor. [Detective Tom Dunjer is sent on a nightmare odyssey through the very fabric of the universe in pursuit of Dr. Sass, a mad scientist whose diabolical device, "The Activator," will destroy this and all other worlds, unless he can be stopped.] The nonstop chase leads through a variety of bizarre, and frequently scary scenes. Haiblum is one of the few science fiction writers like Ian Wallace and John Boyd (with one exception) whose work is exclusively at novel length.

HAMILTON, Edmond (C)
THE BEST OF EDMOND HAMILTON
 selected by Leigh Brackett
 SF Book Club/April/\$2.49+
 Ballantine/August/\$1.95

After a career that paralleled the entire development of modern science fiction, Edmond Hamilton died on February 1, 1977. Affectionately dubbed "World Wrecker," he was famous for his space opera, especially the archetypal 'Captain Future' series. To Hamilton goes the honor of having been the first to have his magazine SF collected, in 1936 (1). The present retrospective selection was edited by his wife of thirty years, Leigh Brackett. Forthcoming are a collection of her best stories, edited by Hamilton and a very special book to be published by Byron Preiss.

HANCOCK, Niel (F)
GREYFAX GRIMWALD
 (Circle of Light series No. 1)
 Popular Library/April/\$1.95

FARAGON FAIRINGAY
 (Circle of Light series No. 2)
 Popular Library/June/\$1.95

HERZOG, Arthur
HEAT
 Simon & Schuster/June/\$8.95

The hero of this new disaster by the best-selling author of **THE SWARM** and **EARTHSOUND** is an engineer who [assembles evidence that, due to atmospheric carbon dioxide reaching a critical level, the world's climate is shifting drastically in a direction that will soon make it inhospitable to all living things. Despite the unusual weather prevailing over the United States, neither the government nor the people will listen. The horrifying heat begins. Massive hurricanes shatter the landscape. Streets buckle and city parks turn into tropical swamps. An extraordinary "Earth-Sun" [launch is the one remaining hope.] Sounds like **THE HAB THEORY** in reverse.

HOGAN, James P.
INHERIT THE STARS
 Ballantine-del Rey/May/\$1.50

In the future a human body in a space suit is found on the Moon. Scientists are at a loss to account for it but it must have come from Earth and may have been there for as long as fifty thousand years. While this disconcerting relic is being evaluated, a spaceship from what seems to be a twenty-five million-year old civilization is accidentally discovered on Ganymede. A connection between the two is indicated when it is learned that the skeletal remains of the Ganymede alien resemble a small food-fish found in the ruins of the age-old moonbase. How can this be? What strange pattern will be revealed and what light will it shine on the mysteries of Man's place in the universe? NIVEN'S WORLD OF PTAUVS and Clarke's 2001 are called to mind, rather than the theories of VonDaniken. New Author.

HOLDSTOCK, Robert P.
EYE AMONG THE BLIND
Doubleday/April/\$6.95

Born in 1948, Robert Holdstock is a rising British author with a degree in zoology, who has contributed to SF MONTHLY, NEW WRITINGS IN SF and is featured in SUPERNOVA 1. After long absence, Robert Zeitman returns to the planet Rec'dworld in search of a reconciliation with his former wife with whom he once studied the local alien culture. As it turns out, she has 'gone native', taken up with one of the four-eyed, burrowing Rec'd and lives as one of them. A mysterious plague is ravaging the galaxy and the planet seems about to be overrun with refugees. Ghosts of a now-extinct superrace further complicate an ambiguous situation. A second novel by Holdstock, EARTHWIND, is forthcoming from Faber & Faber, English publishers of this book in 1976.

HOSKINS, Robert
TO CONTROL THE STARS
Ballantine-del Rey/June/\$1.50

[A thousand years from now, humanity is undertaking its first tentative exploration of its region of space. A Society for Hominid Studies has been formed to supervise the program, but there is dissension among its leaders. Hugh Eliot is the most outspoken advocate for letting the human cultures contacted develop on their own. His nephew, Shan, a recent graduate of the Federation school system, becomes a tool in the hands of the opposition, who seek to use him to control the activities of his uncle. Not content with this, they arrange for Shan to be sent on a fake assignment from which he is not expected to return. Narrowly escaping a human sacrifice in a native religious ritual, Shan flees through a star gate, but without a code. If he survives, he vows, he will return to help his uncle in reforming the corrupt Society.]

HOWARD, Robert E. (F)
THE SWORD WOMAN
Zebra/May/\$1.50

A novel (?) featuring Dark Agnes, a spirited red-haired witch of peasant stock who stabs her betrothed on the day of their wedding rather than suffer the bonds of matrimony. Needless to say, that's only the beginning.

Drew Whyte

The Galileo PRIZE

For the short-short story under 3000 words

The short story requires a greater concentration of talent and energy than any other form of fiction. This special story form is not only the foundation of Science Fiction, but a unique American contribution to literature (credited to Edgar Allan Poe and the tabloid publishers of the 1840's). The short-short story, under 3000 words, is an even more difficult and demanding form calling for a special synthesis of theme, plot, characterization and setting which, at its best, approaches poetry in concentrated impact.

GALILEO magazine would like to encourage this art form through an annual prize for the best work received for publication during any one year. All works of fiction under 3000 words received between January 1st and December 31st will be considered for both publication in GALILEO and the annual prize, to be awarded in spring of the following year.

We hope that, by offering a substantial amount in the form of prize money in addition to our regular rates, both new talent and those more established writers who would be more likely to spend their time on longer works, will be encouraged to submit work to GALILEO throughout the year. Frederick Brown, Isaac Asimov, and Ray Bradbury serve as the exemplars of the short-short story in Science Fiction, but "name" value will not be considered as each story is judged on its own merits.

First Prize: \$300, Second Prize: \$200; Third Prize: \$100.

All submissions must contain a self addressed, stamped envelope. Each must be completely original and previously unpublished. Manuscripts should be sent to:

GALILEO, 339 Newbury Street, Boston, MA 02115

HOYLE, Fred & HOYLE, Geoffrey
THE INCANDESCENT ONES

Harper & Row/May/\$7.95

[Through a cryptic sentence in a lecture, a young art student receives a message to buy two books in the university bookstore. When he opens the package a third book has been included which leads him on a series of startling adventures.] Fred Hoyle, the internationally known astrophysicist and his son have together also written **ROCKETS IN URSA MAJOR**, into **DEEPEST SPACE**, **THE INFERNO**, and **THE MOLECULE MEN**.

JAKES, John (C)
THE BEST OF JOHN JAKES
Daw/June/\$1.75

The astonishing success of John Jakes' American Bicentennial Series (over twelve million copies in print!) has catapulted him into the status of a national celebrity. Few among his new public realize that he has been writing SF and fantasy since 1950! This book contains the portion of that body of work which Jakes considers his best. The volume is dedicated to Donald A. Wollheim, to whom he gives the credit for having interested him in writing historical fiction. Included are twenty-four stories and **ON WHEELS**, according to Jakes, his best SF novel. A bibliography of his SF and fantasy is an added feature. Expect to see more of his earlier work from other publishers.

JARRY, Alfred
THE SUPERMALE
translated from the French by Ralph Gladstone & Barbara Wright
New Directions/April/\$2.45

LAKE, David J.
THE RIGHT HAND OF DEXTRA
Daw/April/\$1.50

THE WILDINGS OF WESTRON
(sequel to **THE RIGHT HAND OF DEXTRA**)
Daw/June/\$1.50

LANCOUR, Gene
THE WAR MACHINES OF KALINTH
(Disinherited No. 2)
Doubleday/April/\$5.95

Gene Lancour is in reality Gene Fisher and this, his second novel, is a sequel to **THE LERIOS MECCA**, which Doubleday published in 1973. It is evidently part of what will be a continuing heroic fantasy saga (with SF trappings). Disinherited, an honest swordsman in the pay of the far-future barbarian Empire of Alithar, is sent behind enemy lines to learn of the activities of one Handlir, the Artificer, a mercenary inventor whose arcane knowledge might spell victory for the loathsome Kalinthian Horde. [Almost against his will, Disinherited is drawn to this powerful and mysterious "wizard", who, like himself, is his own man and, apparently, a man of honor. . . .]

LEM, Stanislaw (C)
MORTAL ENGINES
translated from the Polish by Michael Kandel
Seabury Continuum/May/\$9.95
postponed from February
see **GALELEO** No. 2

LEWIS, C. S. (C)
THE DARK TOWER AND OTHER STORIES
(edited and with a preface by Walter Hooper)
Harcourt Brace Jovanovich/May/\$6.95, \$2.95

The complete shorter fiction of the late C. S. Lewis, including two works published for the first time. Longest is the tide story, all there is of an unfinished novel that [describes the bizarre adventures of five men who witness the demonstration of an extraordinary invention—"the chronoscope"—"something which does to time what the telescope does to space"] One source has it that this was conceived as an alternate sequel to **OUT OF THE SILENT PLANET**. The remaining stories are "The Man Born Blind" (also previously unpublished) and "The Shoddy Lands", "Forms of Things Unknown", "Ministering Angels" and another fragment, "After Ten Years", all of which were previously collected in **OF OTHER WORLDS**.

LORD, Graham
GOD AND ALL HIS ANGELS
Viking/May/\$8.95

A totally bankrupt England has been turned into a giant tourist attraction, the Festival. A secret society which calls itself the Angels of God will stop at nothing to restore the country to its former glory. Published in England in 1976.

LORD, Jeffrey (F)
THE DRAGONS OF ENGLOR
(Richard Blade series No. 24)
Pinnacle/May/\$1.25

MacCONNELL, Colum (F)
TARK AND THE GOLDEN TIDE
Norton Leisure Books/June/?

[Tark, the usurped heir to the throne of the Tumbling Cliffs, accompanied by his mentor, Morned the Flea, journeys from the town of Sorne to the Silver Mountains, transporting the coveted Blue Sapphire, the fabled gem of luck for the Sornese.] Colum MacConnell is reported to be a pseudonym for two young Englishmen with a previous association with the Monty Python group.

McCAFFREY, Anne (C)
GET OFF THE UNICORNI
Ballantine-del Rey/June/\$1.50

Thirteen stories are included in this first collection by the "Dragon Lady" of science fantasy. These range from her second, the well-liked "The Lady in the Tower" (1959) to new fiction written especially for the book, as well as others that have been published only in England or in small-circulation publications. For Fern-lovers, there is "The Littlest Dragonboy", a children's story. There is a previously unpublished tale, "Honymoon", about Helva, The Ship Who Sang, a novella, "The Meeting of Minds", and "Apple", "Finder's Keeper", "Dull Drums", "Daughter", "Changeling" (new), "The Great Canine Chorus", "The Thorns of Baveli", "Horse From a Different Sea", "A Proper Santa Claus".

MARTIN, George R. R.
AFTER THE FESTIVAL
ANALOG/April-May-June/July
"Since the Neolithic Era, human tribes

have gathered together at special times of the year in traditional celebrations. In Martin's novel, each of the major characters brings a different cultural background to a festival planet, to produce a many-tiered conflict." (Ben Bova: In Times To Come, ANALOG, April, 1977.)

MERLE, Robert
THE VIRILITY FACTOR
translated from the French by Martin Sokolinsky
McGraw-Hill/April/\$9.95

The American way of life is transformed by the advent of a [sex-linked disease that spares only women, boys and men over sixty] in this new novel by the author of **THE DAY OF THE DOLPHIN** and **MALEVIL**. As encephalitis 16 proceeds to wipe out the male population, the reins of government and industry are handed over to the wives of those in power and soon the country is ruled by [a female elite in a proto-fascist matriarchy]. Merle takes advantage of this fictional catastrophe to make much trenchant commentary at our very great expense.

MOORCOCK, Michael (F)
THE VANISHING TOWER
(4th in revised, chronological SAGA OF ELRIC)
Daw/June/\$1.25

This is a revised authorized version of the book previously published as **THE SLEEPING SORCERESS** and brings to a close the SAGA OF ELRIC OF MELNIBONE.

MORRIS, Janet E.
HIGH COUCH OF SILISTRA
Bantam/May/\$1.75

MYERS, Howard L.
CLOUD CHAMBER
Popular Library/May/\$1.50

NIVEN, Larry & POURNELLE, Jerry
LUCIFER'S HAMMER
Playboy Press/June/\$9.95

Much more of a mainstream book than anything previously published by either of the authors, this is a disaster novel with the presumed potential for bestsellerdom and an eventual big-budget movie. In a manner apparently similar to Fritz Leiber's in **THE WANDERER**, Niven and Pournelle tell of the reactions of a varied group of people to the imminent approach of the Hammer-Brown Comet, known as Lucifer's Hammer. [The discoverer of the comet, for example, does not expect to live long after it cracks Earth's crust and the molten iron from the planet's core vaporizes enough sea water to inaugurate a new ice age. Who will survive and what will the new world be like after Lucifer's Hammer falls?]

OFFUTT, Andrew J.
MY LORD BARBARIAN
Ballantine-del Rey/April/\$1.50

[A swashbuckling sword-and-planet adventure in the tradition of Edgar Rice Burroughs and Leigh Brackett, Valeron, barbarian conqueror of one of the planets that circles Caramel—seat of a far-flung star empire—is ready to assume his duties as leader of his planet. A heroic swordsman and man-

The Aleph

ter strategist, Valeron comes to pay homage and to claim the Emperor's young daughter as his bride, only to discover the Emperor dead and himself the prime suspect for his murder.) Featured are a dastardly usurping Prime Minister, the Princess' delectable handmaiden, who has designs . . . etc.]

THE SIGN OF THE MOONBOW (F)
(Cormac MacArt series No. 3)
Zebra/April/\$1.50

POHL, Frederik & WILLIAMSON, Jack
THE STARCHILD TRILOGY
(one-volume edition of THE REEPS OF SPACE, STARCHILD and ROGUE STAR)
Pocket Books/May/\$1.95

POURNELLE, Jerry (C)
HIGH JUSTICE
Pocket Books/May/\$1.75

Whether or not it is an author's deliberate intention, one good way of becoming known to the fans as a writer to watch is for him or her to take the trouble to write several stories with the same background or, still better, to connect a large part of his or her work in some kind of grand design. (Generally called a "future history", after Heinlein, who coined the term; excuse the lecture.) Jerry Pournelle has always done this, as may be seen in this new collection. "High Justice", "Extreme Prejudice", "Consort", and "Tinker" are all stories set in the Hansen Enterprises' "universe" (the first three feature Aeneas MacKenzie). Three of them were Hugo Award nominees. "A Matter of Sovereignty" and "Power to the People", originally published as by "Wade Curtis", belong to the "Nuclear General Series".

POURNELLE, Jerry, see also NIVEN

PROCTOR, Geo. W. /\$1.75
THE ESPER TRANSFER
Major/May/\$1.50

REYNOLDS, Mack
EQUALITY: IN THE YEAR 2000
(sequel to LOOKING BACKWARD, FROM THE YEAR 2000)
Ace/May/\$1.50

ROBERTS, Keith (C)
THE PASSING OF THE DRAGONS
Berkley/April/\$1.75

ROBINSON, Spider
CALLAHAN'S CROSS-TIME SALOON
Ace/June/\$1.50 (C)

SARGENT, Pamela (C)
STARSHADOWS
Ace/June/\$1.75

The first collection of shorter fiction by the author of CLONED LIVES. Included are ["Shadows", "Gather Blue Roses", "Oasis", "Julio 204", "IMT", "Desert Places", "The Other Perceiver", "Bond and Free", "If Ever I Should Leave You", "Clone Sister"]. An introduction is supplied by Terry Carr, in whose UNIVERSE anthologies several of these stories originally appeared. Ms. Sargent is also the editor of BIO-FUTURES, and WOMEN OF WONDER (and its successor).

Drew Whyte

SHERRELL, Carl (F)
RAUM
illustrations by Stephen Fabian
Avon/May/\$1.50

SIMAK, Clifford D.
A HERITAGE OF STARS
Berkley-Putnam/June/\$7.95

SMITH, E. E. "Doc", see GOLDIN

SOLDATI, Mario
THE EMERALD
translated from the Italian by Wm. Weaver
Harcourt Brace Jovanovich/May/\$8.95

SPRINGER, Nancy (F)
THE BOOK OF SUNS
Pocket Books/June/\$1.

Another publisher enters the lists in the New Fantasy Tournament with a tale of conflict between mortals and supernatural beings in an imaginary realm with medieval trappings. As everyone knows, there are good Elves and, then again, there are . . .
New Author.

STRUGATSKY, Boris & Arkady (C)
ROADSIDE PICNIC & TALE OF THE TROIKA
translated from the Russian by Antonina W. Bouis; selected by Roger DeGaris & Berta Klyuyeva
(Best of Soviet Science Fiction Series No. 1)
Macmillan/May/\$8.95

With this book Macmillan begins a major new program. As a result of a contract signed in 1975, this publisher now has the right of first look at all Soviet science fiction for a ten-year period. In addition to more by the Strugatskys, in the immediate future Macmillan will offer works by Kirill Bulchey and the writing team of Mikhail Emtsev and Eremei Parnov. This collection is the third book by the brothers S. to see print in this country. The two short novels included are a tribute to the authors' versatility. "Picnic" tells of the aftermath of an extraterrestrial visitation. In the deadly 'Zones' the aliens casually left behind them incomprehensible artifacts of limitless potential and value to man that to them may have been only 'litter'. The shorter 'Troika' is a ferociously satirical farce on bureaucracy, the cumulative effect of which is surrealistic horror. A minor municipal commission is stranded in an elevator on the 76th floor of the Edifice of Knowledge, a storehouse for 'the anomalies of nature and society', where they proceed to deliberate endlessly on the inexplicable. There is an introduction by Theodore Sturgeon.

TUBB, E. C.
HAVEN OF DARKNESS
(Dumarest of Terra series No. 16)
Daw/May/\$1.25

Zatym was to have been merely a way station for Earl Dumarest on his long quest for Earth. He might have thought twice before setting foot on the planet of the double sun had he known of the [unwritten] treaty with an unseen species that divided the world forever. In day, Zatym belonged to humanity; by night, it was a hostile and alien world where spectres walked and

criticized the works of the living.]

VAN SCYOC, Sydney J.
CLOUDCRY
Berkley-Putnam/May/\$7.95

Another offbeat novel of "mystical adventure" by the author of STARMOTHER and at least two other novels. Victims of an incurable disease, [two humans and a bird-like alien are banished to a remote, unexplored planet. Escaping from quarantine, they discover the fantastic, decadent city of a once-great race whose descendants live in primitive squalor.] Among these is Aleida, in whom lies the potential for an incredible transformation into a being of enormous powers. It is the arrival of the three exiles that will lead to the accomplishment of her strange and terrifying destiny.

VAN VOGT, A. E.
THE ANARCHISTIC COLOSSUS
Ace/April/\$1.75

Van Vogt's newest novel [takes place on a future Earth where anarchy has become a way of life. It is, however, a very special brand of anarchy, one that is controlled by the mysterious Kirlian computers. . . and one that must deal with a race of aliens who look upon the conquest of Earth as part of a very entertaining game.]

VARDEMAN, Robert E.
THE SANDCATS OF RHYL
Major/June/\$1.50

VARLEY, John
THE OPHIUCH HOTLINE
Dial Quantum/April/\$8.95
SF Book Club/July/\$1.98+

This book is the inaugural selection of an ambitious SF international SF publishing program under the supervision of James Wade. Donald R. Bensen is editor, with Ben Bova and Isaac Asimov serving as advisors. The new imprint will be known as Quantum Books. . . . John Varley's first fiction was published in August 1974. Since that time fourteen stories have appeared under his name and Mr. Varley has been twice nominated for the John W. Campbell Award.

WOLF, Gary K.
A GENERATION REMOVED
Doubleday/May/\$5.95

America has always worshipped Youth. In his second novel, the author of KILLERBOWL depicts a near-future society that is the ultimate consequence of this propensity. As a result of giving the vote to all adolescents, power is in the hands of those aged twelve to twenty. After 55, euthanasia is the average citizen's expected fate. Understandably, not everyone is happy with this state of affairs. Our hero, a [once-proud but now browbeaten 50-year-old] is ordered to infiltrate an organization of rebel "oldsters". Considering his age, it is not surprising that he, too, becomes a rebel. [cf: LOGAN'S RUN. . . WILD IN THE STREETS. . . Richard Matheson's "The Test".]

WELLMAN, Manly Wade
THE BEYONDERS
Warner/April/\$1.50

Continued on page 94

Reviews

Who has not dreamed of taking casual strolls five thousand feet up among cloudy castles. . . ?

A SCANNER DARKLY

by Philip K. Dick
Doubleday, \$6.95.

Reviewed by Floyd Kemske

Philip K. Dick practiced for this book. In the mid-1960s he took up the subject of mind-altering drugs, using it in a number of works—perhaps most successfully in *The Zap Gun*. At about the same time he also produced a remarkable novel dealing with insanity; *Clans of the Albane Moon* is virtually a clinical exercise in psychological disorders. These two themes—drug abuse and insanity—complement each other and Dick exploits the fact in the novel he considers his masterpiece, *A Scanner Darkly*.

The scanner of the title is the holographic surveillance device used by the narcotics bureau to monitor the activities of Robert Arctor, suspected vendor of harmful drugs (most notably the super-addictive, highly toxic, and great fun compound called "Substance D" or just "Death" for short). The holographic tapes reveal the comings and goings of Arctor,

his girl Donna (whose overweening but basically pedestrian ambition is reminiscent of Tuesday Weld as Thalia Meninger), his friend and roommate Luckman (an energetic and cheerful junkie who has not yet suffered too much damage), and his other roommate Barris (self-styled genius who is convinced he can obtain a gram of pure cocaine from an eighty-nine cent aerosol can of Solarcaine sunburn medicine).

The monitoring of these people is done by a narcotics agent known simply as "Fred." In a twist you would expect of Philip K. Dick, Fred wears his disguise (a computer-enhanced mechanism called a "scramble-suit") when dealing with his employers and does his undercover work by posing as himself. He is, in fact, Robert Arctor...Fred's assignment. Fred has been reporting on Donna, Luckman, Barris, and himself for years. But the bureau has recently become suspicious of Arctor, whose activities ("...comes and goes mysteriously, especially around sunset. After he arrives home he eats, then on what may be pretexts takes off again. Sometimes very fast. But he's never gone for

long...covertly funded, covertly engaged..."), are those of a narcotics agent rather than those of a dealer in Substance D.

Needless to say, Fred must cultivate a certain amount of detachment in order to continue reporting on himself and his friends. And the detachment evolves to schizophrenia as Robert Arctor's drug-saturated brain turns to jelly (which is Dick's apt image to summarize the degeneration of neural connections into random configurations). Fred's growing madness and the mystery inherent in the structure of the enormous drug industry of the not-too-distant future form the substance of this book. It is a complex story and I hesitate to give away the mystery, which involves more than just Arctor's betrayal to the authorities by his "friend" Barris.

Dick tried to write this book without moral judgment, but it is still a legitimate question to ask what he thinks about drug abuse. The answer must lie in the less than coherent dedication at the end of the book. "Drug misuse is not a disease," he writes, "It is a decision." His feelings are ambivalent, as ambivalent as those



The Best
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EXHIBIT



of Robert Arctor, junkie/narc. Junkies must blame themselves for their condition, Dick believes, but the punishment is out of all proportion to the crime. This ambivalence is reflected in the novel: he laments the addicted babies of junkie mothers, too young to endure withdrawal (surely an image intended to conjure up condemnation), but he also laments the condition of presumably responsible adults like junkie Jerry Fabin, who stands in the shower for hours and sprays himself with insecticide in a futile attempt to get rid of the aphids which he believes cover his entire body.

Dick dedicates this book to the sufferers of drug misuse and includes himself in the list of names. He therefore writes from experience and it is an experience the reader will never forget.

WALKERS ON THE SKY

by David J. Lake
DAW, \$1.25.

Reviewed by David Johns

Some of the best or most popular works in science fiction and fantasy are those with well-made worlds, the kind that offer the reader rambling and exploring ground through more than a single book. Examples are Tolkien's Middle Earth, Burroughs's Barsoom, Farmer's Riverworld, and Herbert's Dune. Frequently these worlds are the scenes of daring deeds, epic battles, and complex mysteries that thick-skulled heroes unravel. David Lake has started building such a world, and readers may hope he continues his work. His idea is really too good to use up in one book.

It is described in the book's title, a world where one can literally walk on the sky. Thus it taps one of humanity's primal fantasies, even more enticing than the idea of flying. Who has not dreamed of taking casual strolls five thousand feet up among the cloudy castles, smoky dragons, and misty maidens that float above the dusty plain? But on Lake's sky one can do even more. Ships jockey across it on voyages for war or profit while keeping a lookout for roaming bands of pirates and occasional islands inhabited by crochety lighthouse

keepers with beautiful daughters. Moreover, that's only one layer of a triple-decker world. On the bottom is the lush land of the Neathings who dig, swim, or fly, depending on their race. At the top, or in "heaven," live near-immortal "gods" who observe and direct the goings on below in order to combat boredom, but it is the middle or "sky" world where the most of humanity is engaged in its usual pastimes of making love, money, or war.

The technical explanation for all this is that it's a small planet that's been terraformed by the "gods" and is surrounded by force fields of varying strengths to hold in the atmosphere, a dome world in other words. However, for most of the book the story, not the technology, is the thing which captivates the reader.

No "stay-at-home" ever had an interesting life, so naturally the hero is a wandering soul looking for nothing in particular. Signi Signison is a young, competent but inexperienced hillman banished from his tribe. He enlists as a marine on a skyship and from then on falls (sometimes literally) into one thing after another: slavery, escape, imperial service, love, and eventually the generalship of an army that almost destroys the sky world. And, being considered by the authorities too dangerous to run loose, he ultimately ascends to the heaven of the gods.

It's good fun with some entertaining jabs at human nature, such as a party of liberal and progressive imperialists who wish to extend the blessings of civilization (i.e., slavery) to the lower world. We hope DAW will not miss the chance to make this the beginning of a new series to join the others already on its lists.

THE BEST FROM THE REST OF THE WORLD: EUROPEAN SCIENCE FICTION

Edited by Donald A. Wollheim
Doubleday, \$7.95.

Reviewed by Floyd Kemske

For those of us who could succumb to the notion that science fiction is an American art form, Donald A. Wollheim offers an antidote. *The Best From the Rest of the World* is a misnomer (only Western European

work is included), but it does comprise fourteen stories which are definitely science fiction and have all been published previously in other languages. Nine countries are represented: Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, and Sweden. Editor Wollheim does not pretend that his omission of several other continents' worth of science fiction was anything other than intentional. The omission is understandable, given space limitations (although we might question the assumptions behind any attempt to take on such a project in the confines of 267 pages).

Wollheim introduces his collection with a fine description of the industry in Western Europe. It ranges from countries in which science fiction is dominated (if not wholly owned) by one or two people (Denmark) to those in which the market is so strong as to support lavish publishing ventures that would languish on this continent (France). And Wollheim's individual short introductions fit each story in the body of the author's work and identify it as "New Wave" or "Old Wave" or whatever.

The stories are not limited in type. They extend from an outrageous burlesque on urban congestion ("Round and Round and Round Again" by Domingo Santos: Spain)—in which the hero travels for days in search of a parking space—to an empathetic narrative of insanity in outer space ("My Eyes, They Burn!" by Eddy C. Bertin: Belgium)—about an unwilling cyborg in the shape of a rocket. When the stories are disappointing ("The Scythe" by Sandro Sandrelli of Italy has a crew of humans reactivating an alien doomsday machine with incomprehensible religious/aesthetic overtones), they are no more disappointing than current American work. When they are outstanding ("Party Line" by Gérard Klein of France is a story wherein a closet writer discovers a way to telephone from the future to advise himself on a course of action that will enable him to acquire a villa in Ibiza and a lifestyle to match), they rank with the best in this country. The translations are good (I suppose a translation is good when you lose track of the fact it is one) and when they are not so good, they are serviceable. "The King and the Doll-

maker" by Wolfgang Jeschke of Germany is a serviceable translation, which is actually something of a disappointment because good stories about time travel are difficult to understand with the best of conditions.

If there is any basis for criticizing the book, it is that Wollheim leaves the attribution of individual stories to that most cryptic element, the "Acknowledgments." I have always had a little bit of trouble with "Acknowledgments" (the print is so small), but I don't think these would be much use to anybody. It is not always possible to tell where a story might have first appeared, so the aficionado will be correspondingly disappointed. But perhaps the aficionado should go to Europe to see for himself and leave popular anthologies to those of us just seeking entertainment.

THE SWORD OF SHANNARA

by Terry Brooks
Random Hse./Ballantine, \$12.95/\$6.95

Reviewed by David Johns

Recent years have seen fantasy and science fiction become potentially profitable categories for hardback publishers. Putnam's had *Children of Dune*, Simon & Schuster had *Sbardik*, Macmillan had *Watership Down*, Harcourt Brace had *Imperial Earth*, and Houghton Mifflin had *The Lord of the Rings* and later this year will have *The Silmarillion*. One wonders if this success may be leading to overhype, the promotion of dubious works from a spirit of house rivalry and desire for a share of the profits in a hitherto largely unexploited field. A case in point is the simultaneous publication of *The Sword of Shannara* by Random House and Ballantine. The book is such as to cause the reader to ask more in sadness than anger why Lester del Rey and the publishers thought this work deserving of so much hoopla. It is a particularly great disappointment since it is one of the first of the new Del Rey Imprints.

A large body of readers (myself included) have longed and hoped for a revival of a fantasy line such as Ballantine had in their Adult Fantasy series. If *TSOS* is an omen and exemplar of things to come, then readers may as well start cringing in

anticipation.

One hardly knows where to begin in criticizing a work so poorly written. Brooks's prose is uninspired; full of clichés and inappropriate word choices. Fantasy can be magical, poetic, and stirring. Instead Brooks uses anachronisms of modern day slang and figures of speech that jar the reader's sensibilities, destroying any possible spell the story might have created. Likewise the characters are shallow and utterly forgettable. We cannot care what their personal problems or mysteries may be from the portraits presented. As an example: the Skull Bearers, supposedly the most deadly servants of evil, come across as hollow costumes of black crepe and cheaply molded papier-mâché. In potentially exciting scenes Brooks breaks the cardinal rule of fiction, to tell the reader what is happening rather than show him, but he does this all through the book. Over and over scenes are recounted in spiritless narration rather than allowing the characters to perform.

The plot is a basic fantasy one. In fact, the book is admittedly written under the inspiration of Tolkien's *Lord of the Rings*, and the similarities are so strong as to wholly rob the story of any sense of originality. One recognizes settings, events, characters as pallid imitations of Tolkien creations. We have an assortment of adventurers, a smattering of elves, a dollop of dwarfs, and a few princes, plus a magician in quest of a magical sword that will save humanity from blackest evil's imminent assault. The setting is Earth several thousands of years from now after wars have reduced mankind to a remnant now sharing the world with other races. Where have you heard this before? You don't have the time to count. It is an age of magic though traces of our time linger on (as with a ghostly being who wanders about in the night with a flashlight!).

For the reader hardy enough to get so far, there is change halfway through the book. The description of the Archvillain's castle hall with his whining, cringing scyophants and the introduction of Panamon Creel, a roving bandit who smacks of Errol Flynn, and his companion, the gigantic rock troll, Keltset, these things may make the reader jump for joy. At last there is color, and poetry. The characters live and breathe instead of being

grey drones. Since the book was written in two segments ten years apart, one thinks that time may have wrought a miraculous improvement in Brooks's abilities...but the reader is doomed to disappointment as the book again sinks back into the uninspired prose of before—Keltset and Creel being only an island in the swamp, not the shore.

From time to time the characters stop to wonder if all their trial and tribulation is truly necessary and worth the effort. The answer for the reader is in the negative. It should be a small matter for the caliber of Del Rey books to improve, but a matter of concern if they do not.

TURNING POINTS: ESSAYS ON THE ART OF SCIENCE FICTION

Edited by Damon Knight
Harper & Row, \$12.50.

Reviewed by Floyd Kemske

There are people writing graduate dissertations on science fiction these days, a fact which gives pause to a lot of us fans. Many have looked on these attentions of the academic world as a good sign—an indication of science fiction's "arrival"—but some of us, myself included, derive about as much comfort from it as we would from being present at the medical examination of an old friend. We have no assurance that any good will come of the incessant prodding and poking.

It is therefore refreshing to see a collection of essays on the art of science fiction written by science fictionites. *Turning Points* is an analysis of science fiction blissfully free of the insanity usually found in graduate dissertations (I do not think the word "escapism" occurs once in 303 pages...the concept being irrelevant to the book's purpose). Here, for the most part, are people who "do" science fiction: telling us what they do, why they do it, and most importantly how they do it. It is valuable information for both fan and author.

There are twenty-six essays covering seven topics in this volume. Several of the topics are obviously *de rigueur* in a book of this nature. The history of science fiction is interesting but can provide little sense of heritage to the

addict or the writer (will we ever be free of this debate over the status of *Gulliver's Travels*?). And the section on the prophecies of science fiction strikes me as insignificant.

Some of the topics appear predictably but achieve originality in approach. The section on criticism features James Blish writing under a pen-name on the subject of James Blish and an eloquent plea by Joanna Russ for emancipation from the macho-hero in science fiction. The chapter on the definition of science fiction includes an unusual attempt by Damon Knight to accomplish the task with quantitative methods and an explanation by Isaac Asimov of the difference between a chess game and a chess puzzle which should be part of any writer's arsenal.

The unexpected chapters are worth their weight in coffee. The section on how to write science fiction has Damon Knight giving a nuts and bolts account of how to create and market your story. In addition, there are a group of equations and conversions from Poul Anderson which will show you how to plot the location, determine the climate, and calculate the effects of gravity on the planet you are writing about. One of four memoirs in a chapter entitled "Confessions" has Isaac Asimov revealing the circumstances of the conception of *Foundation* (Would you believe it started with a line in a book of Gilbert and Sullivan plays on a New York subway?).

The footnotes supplied by Knight make for the most amusing reading since the short stories of William Tenn. Every time an author uses the expression "someone who shall remain nameless", Knight names the person. He gives the ultimate sources for items the authors perceive as dim childhood memories, supplies anecdotes calculated to make you laugh out loud, and even tells you who flunked out of MIT. The breadth of Damon Knight's knowledge, or research, or both, is impressive.

There are twenty-one authors here (names which will spark instant recognition even among dilettantes), represented by conference speeches, editorials and letters from science fiction publications, excerpts from books, and two previously unpublished essays. It is stuff you would be hard put to collect on your own and if you write science fiction (or even if you are just addicted to it), you would do well to

have this book in your reference library. Let us hope it can appear in a durable paperbound format with a price within the means of a group which tends to shun employment security.

—G—

Editorial—Continued from page 4

much as we can. (If you do not receive your copy of *Galileo* by the 15th of the month following publication, write and tell us.)

To keep our editorial contents improving as much as *Galileo's* physical aspects (the graphics and artwork are improving with each issue.) we are holding a short story contest. It is our hope the contest will allow us to provide more and superior material in each issue. It will also allow us to provide a bit of extra compensation to some of our contributors. The details on the contest appear elsewhere in the magazine.

Galileo is still small and even though the first issue is sold out that is still only a modest success. At best, we have broken even on the first issue. (It is highly unusual for a new magazine to do either with its first issue.) For us to continue improving the physical and editorial quality of *Galileo*, we realistically need to double our present circulation figure.

Toward that end, we again ask your help. Tell us what you like about *Galileo*, so we can provide more of it. Let us know if you have any complaints. Most important, talk to your friends about us. Ask your local bookstores and university bookstores to carry us. Our address is on the contents page.

The faster we grow, the sooner we can bring *Galileo* to you on a bi-monthly basis. Perhaps even more important is the fact a larger circulation will allow us to pay our authors and illustrators higher rates—they do have to eat. That particular improvement will permit us to pick from a greater range of material and further insure the quality of our product.

Those of you who have been with us since the start now have some idea of where we are going. Some of you have already extended your subscriptions (Thanks for the vote of confidence). Those who haven't can do so before issue No.4 in July. Each subscription, each new bookstore helps guarantee *Galileo's* survival. Each

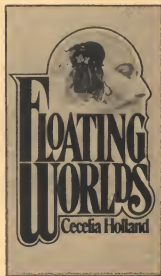
small advance brings us closer to our goals. And, as long as we can continue making these advances, we'll keep improving *Galileo*, keep bringing you progressively better entertainment.

In our first issue, we dedicated *Galileo* to the concept that man's destiny is not bound to the planet Earth. Now we'd like to compare our early and modest success to the similar early success of the space program. As spectacular as man's first step on the moon was, it was but a child's crawl relative to the long voyages which lie ahead. Likewise, *Galileo's* first steps, without diminishing their value, give but a hint of what is to come. Climb aboard and journey with us... and thanks again for letting us leave those first footprints.

—G—

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—SF Review



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Letters

... a star is a penultimate manifestation of the underpinnings of all existence. . .



Dear Mr. Ryan:

I must say I liked the story in No. 1 about the illegal alien, "Next Door Neighbor" by Kevin O'Donnell, Jr.

But I noticed some strange things. (1) It seems on page 47 we have this alien touching the elevator with his tongue as well as chewing the elevator with his mouth. I think this should be elaborated upon. Was this alien that strong-jawed? Perhaps this is a clue to the planet he came from . . . some iron world? Then I wonder how the elevator survived the chewing. Evidently it did, but certainly there must be some teeth marks still on it to this day.

(2) Then what was this alien's first name? A. H. or H. A.? I can see a scope of mystery in this. We really don't know who the alien is, but we have two ways of looking at him. We see him in a gasp of surprise—Ah. Or we see him as a jolly fellow—Ha. Of course it may be that on his planet they have revolving names, which lets us understand even more this poor fellow's predicament.

Well, we can feel sorry for him.

Sincerely,
Jeff Byrd
Angwin, CA

To the Editor:

Concerning the article you reprinted discussing the relative disadvantages of various power sources; the article concentrates heavily on defending the nuclear alternative as being much safer not only than commonly assumed but even than the other fuels.

But this is only half the picture. In fact, this side of the argument is so well recog-

nized by professionals that the potential for serious harm from a runaway reactor has been relegated to a secondary position in the debate. What the recent—and still unresolved—oil crisis has emphasized is the question of whether or not nuclear power really is competitive with other power sources.

When nuclear power began being implemented, and for most of the past three decades, uranium processing was carried out by the Federal government. It turned out to be so inefficient that almost all the power ultimately produced from the fuel rods came not from the inherent radioactivity but from the energy required to concentrate the U-235 from the ore. Most of this energy came from TVA; the fuel rods were just storing hydroelectric energy—at fantastic cost. As time progressed, the process gained efficiency, so that some of the latent energy is finally being tapped; but non-breeder reactors are still unable to extract more than a few percent. Laser separation, by lowering the cost of isotope concentration, promises to increase that efficiency, but laser separation is still unproven for this particular task; and even with that reduction only two or three percent of the latent energy is available.

Furthermore, the processing of much more ore, which will be essential if nuclear power is to assume a major role in satisfying domestic needs, will use more energy than perhaps the current capacity can handle. The conversion is not in the near future.

And then there is the simple fact, again, that radioactive isotopes are non-renewable, and that the U-235 known and assumed to

be available will not last much longer than the fossil fuels.

So our intermediate-term nuclear alternative is solely the breeder reactor, which promises—on paper—to unlock more than 60% of the energy in the uranium. But there are substantial drawbacks to this promise.

(My source for the figures in this letter is an article in *SCIENCE* 195: 551–556, which appeared on 2/11/77.)

First, the breeder is not proven. It must be assumed that it will cost far more than non-breeder reactors, especially at first, if only because of the extra cost of the reprocessing plants. Furthermore, it will not realize its full potential for operation for some years, and not just because the conditions must be fine-tuned for optimal performance in operation. A major delay would be required because most of the more than 50% extra energy that the breeder should be able to release is in generated plutonium, and this must be processed from the waste before it can be utilized.

Which brings me to a far more critical point: the processing of the waste into new fuel. Again, this technology is thoroughly unproven (this is not strictly a disadvantage, but it is a caveat and a delay in implementation). And here the safety factor does become critical. Plutonium is very toxic: milligram (10^{-3} gm) quantities are fatal, and if plans are realized, upwards of 2500 metric tons (more than 10^9 mg) will be present at various stages—in fuel rods, processing plants, and in transit. Keeping track of that material with the kind of control implied by the relative magnitudes of the figures (a factor of

more than 10^{12} —enough to kill the entire human population of the globe many times over) is certainly possible. But it will cost dearly.

And then there is the inherent cost of the primary fuel. Depending on the price, we can assume we have available anywhere from 1.3 to over 10 million tons of raw uranium ore. At the low price, we do not have enough for a major conversion to nuclear fuel sources. But in order to assure the larger quantities, the price will have to more than double.

There is the discount rate. It appears that a few percent increase in the discount rate—reflecting an insistence on paying back capital costs and research investments in a short period of time—can make a significant difference in the net economic benefit. Unfortunately, the lower discount rate is economically unsound unless the economy is very strong.

And of course, the demand for electricity is quite variable. Predictions made before the oil crisis have been revised downward almost in half since the 1973 embargo.

Various estimates for the year 2000 have ranged from 2×10^{12} kWh (no growth) to 10×10^{12} kWh, with an average figure of 6.6×10^{12} kWh. In the most recent ERDA estimate, a figure of 8.1×10^{12} kWh was assumed, and this gave the breeder a net benefit. But if the actual figure turns out to be the average of 6.6×10^{12} kWh, then the net benefit could be cut by more than three-fourths, and would be essentially eliminated if the projection becomes realized at less than 6×10^{12} kWh—which still allows for growth of more than 200%.

And the ability of the breeder reactor to supply any of that projected demand is still uncertain. A crash program such as this economy can only barely afford would still not make breeders a reality before 1993, and further delays are likely, even if they are unreasonable.

This is not to say that the breeder cannot pay its way—just that the case is not clear-cut, and whether a benefit is to be realized depends on very critical parameters not varying too far from an average value over a rather long period. Even if no lives are lost in operation, the possibility that nuclear reactors may turn out to be more of a cost than a benefit to society is very real.

Dan Karlan
New York, NY

[We feel the obligation to bring out a few points against this letter. The laser separation process has indeed been proven and is presently undergoing governmental licensing procedures. Breeders are operating in France, England, and Russia. While nuclear plants are less efficient, about 38% to 44% for fossil-fuel plants, the cost of delivering that 38% is much cheaper. Radioactive isotopes are indeed non-renewable, but it's the fissionability that makes the material available as a fuel, not the radioactivity. And what about the cost of land and life associated with coal mining? Or the true 'free-market' cost of a hydroelectric facility? A strip mine is forever, and so is death. Who pays the million or so dollars per day in Black Lung benefits? Yes, plutonium is toxic, if you eat it or sniff it, and there is enough to kill the

human population several times—there is also enough water in the Atlantic Ocean to drown the human race. The demand for electricity did go down with the embargo; but electrical usage is approaching an all-time high right now, and the predictions are going up again. Is the controversy steeped? — Ed.]

Editor:

I just received and read the second issue of GALILEO. I enjoyed it very much, more than the first issue. You have indeed published a professional SF magazine.

I hope you will not be offended if I say I like the "traditionalness" of your stories—you know, old-fashioned stuff like beginning middle-end, plot, characterization, etc.

I enjoyed the article by Hal Clement.

As always he was clear and straightforward and fair. I think he missed one minor interim energy device—the use of unreliable and intermittent wind energy to turn water into hydrogen which can then be (relatively) easily stored—relative to storing electricity directly, I mean.

In the opening paragraphs of Mr. Clement's article he mentioned the danger of extrapolation. I enclose a quote from Mark Twain's *LIFE ON THE MISSISSIPPI*, which in his normal pointed and humorous way, points out the danger of extrapolating, particularly over any stretch of time.

"In the space of one hundred and seventy-six years the Lower Mississippi has shortened itself two hundred and forty-two miles. That is an average of a trifle over one mile and a third per year. Therefore, any calm person, who is not blind or idiotic, can see that in the Old Oolitic Silurian Period, just a million years ago next November, the Lower Mississippi River was upward of one million three hundred thousand miles long, and stuck out over the Gulf of Mexico like a fishing-rod. And by the same token any person can see that seven hundred and forty-two years from now the Lower Mississippi will be only a mile and three-quarters long, and Cairo and New Orleans will have joined their streets together, and be plodding comfortably along under a single mayor and a mutual board of aldermen. There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact."

David L. Travis
Glossboro, NJ

Dear Charles,

Got my copy of GALILEO today, issue No. 2 that is. An historic first: my name on the cover! Thank you. Overall, I think the magazine looks well. I also like the spirit of the magazine as you are presenting it.

I think Ned Wilgus of the L-5 Society is a bit harsh calling you down for the phrase "conquer the stars" in your first editorial. The phrase is of course, imprecise and oblique in its meaning, but I think Hal Clement's article in issue No. 2 states your position relative to ecology fairly well, and lends the phrase "conquer the stars" a nuance which is not cliché.

'Conquer the stars' has come to refer to the achieving of man's highest destiny—not to an act of wanton subjugation. It means that mundane existence, the fight for survival, is not man's highest destiny, not in-

deed even an achievement worth noting.

What are stars? I think most readers of your magazine know that stars are suns and know something about nuclear fusion reactions and astrophysics. Obviously one can not 'conquer' a star in the sense that one conquers a country, or even in the sense that one conquers 'nature'.

"The Stars" is a phrase which has gathered a certain symbolic meaning, a meaning enriched by modern astrophysics. For a star is a penultimate manifestation of the underpinnings of all existence.

The arcane symbolic glyphs by which men represent stars, five pointed, the Seal of Solomon, six pointed, the Star of David, eight pointed, representing the raw life force itself, all have meanings related to the spirit of man.

The physical universe locus-of-incandescence which we call a star is a material analogy to man's spirit.

To say we can and will conquer the stars is to say we can and will conquer the mystery of our existence, role in creation, destiny, and—in short—the purpose and meaning of life, intelligence, cognizance, whatever you want to call it that mankind has and beasts do not.

A magazine devoted to such goals cannot help but be a significant contribution to the evolution of mankind.

May you never lose sight of the meaning of what you are doing.

Live Long and Prosper,
Jacqueline Lichtenberg
Monsey, NY

[I couldn't have said it better myself. Glad you did. — Ed.]

Galleons:

Barber's front cover is breath-takingly well done. As far as illustration goes, GALILEO is easily in position one, as compared to the rest of the SF's periodicals. Hopefully George Barr and Steve Fabian will be seeing color print on your covers soon, since so often they are squeezed into paperback book and digest-sized magazine covers. As for the interiors, Thomas Canty shines as one of the best new illustrators to come along.

Diane Ackerman's "Saturn" is a well of image and idea, and I like it. SF poetry has so few outlets; and, although I don't think a regular department in GALILEO would work, it's nice to know that somebody cares. It provides a needed variety that so few magazines have.

In closing: keep up the good work. No, don't—improve! I look forward to your future.

Taman Shud,
Neil Kvern
Cataldo, ID

Dear Charles:

I was very favorably impressed by GALILEO No. 2 on a number of accounts. Not only with the generally high level of the material but with the "Amazing" fact that you offer 96 pages of material. Are you aware that is the same quantity as the old GERNSBACH AMAZING STORIES back in the twenties? The only difference is that he used cheap, heavy book paper to bulk his magazine up so that it looked like an immense bargain at the price. You offer 1,250

words to a solid page of text, pushing close to 80,000 words without the pictures or contents page. That is more than the average paperback today without the accoutrements.

Another big surprise was your offering of *EFFICIENCY* by Perley Poore Sheehan and Robert H. Davis. It took me a number of years to pick up my autographed little copy. The book is little known.

Every best wish.

Sincerely yours,
Sam Moskowitz
Newark, NJ

The Aleph—Continued from page 87

ANTHOLOGIES

SUPERNOVA ONE: SF INTRODUCTION

Transatlantic Arts/March/\$8.95

(Editors not given; identical volume to British edition, published by Faber & Faber)

ASHLEY, Michael (editor)

SOULS IN METAL: AN ANTHOLOGY OF ROBOT FUTURES

St. Martin's Press/June/\$6.95

BRYANT, Edward (editor)

2076: THE AMERICAN TRICENTENNIAL

Pyramid/April/\$1.95

CAMPBELL, Ramsey (editor) (F)

SUPERHORROR

St. Martin's Press/April/\$7.95

CARR, Terry (editor)

THE INFINITE ARENA:

7 SF STORIES ABOUT SPORTS

Thomas Nelson/April/\$6.95

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CARTER, Lin (editor) (F)

FLASHING SWORDS! NO. 4: BARBARIANS AND BLACK MAGI- CIANS

SF Book Club/May/\$1.98+

Dell/November/\$1.50

DAVIS, Richard (editor) (J)

SPACE THREE

Transatlantic Arts/March/7

(book identical to British edition published by Abelard-Schuman in 1976)

DISCH, Thomas M. & NAYLOR, Charles (editors) (F)

STRANGENESS: A COLLECTION OF CURIOUS TALES

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DOZOIS, Gardner R. (editor)

ANOTHER WORLD: ADVENTURES IN OTHERNESS

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EVANS, Hilary & Dik (editors)

BEYOND THE GASLIGHT: SCIENCE IN POPULAR FICTION, 1895-1905

Vanguard/April/\$12.50
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KNIGHT, Damon (editor)

ORBIT 19

Harper & Row/June/\$8.95

PREISS, Byron (editor)

WEIRD HEROES, Volume Six Pyramid/April/\$1.50

SILVERBERG, Robert (editor)

THE INFINITE WEB

Dial/March/\$6.95

EARTH IS THE STRANGEST PLANET: TEN STORIES OF SCIENCE FICTION

Thomas Nelson/April/\$6.95

NEW DIMENSIONS (No. Seven) Harper & Row/April/\$8.95

VAN TASSEL, Dennie L. (editor) COMPUTERS, COMPUTERS, COMPUTERS: IN FICTION AND IN VERSE

Thomas Nelson/April/\$6.95

WOLLHEIM, Donald A. (editor)

THE 1977 ANNUAL WORLD'S BEST SF

Daw/May/\$1.75

SF Book Club/7

FUTURELOVE: A SCIENCE FICTION TRIAD

Introduction by Gordon R. Dickson
Bobbs Merrill/April/\$8.95

No editor is given for this anthology. The facts are that the stories were purchased by Roger Elwood and edited in manuscript by Barbara Norville (Bobbs 'in-house editor'). In the case of some 'triads', the author of the introduction also supplied the theme for the book, but not here.

Telescope

In upcoming issues of *GALILEO* . . .

"Lancelot's two long feelers, stretching to a length of a hundred feet, wrapped around the whale like a spider's unbreakable web."

Once by Angels Seen by Gordon Eklund

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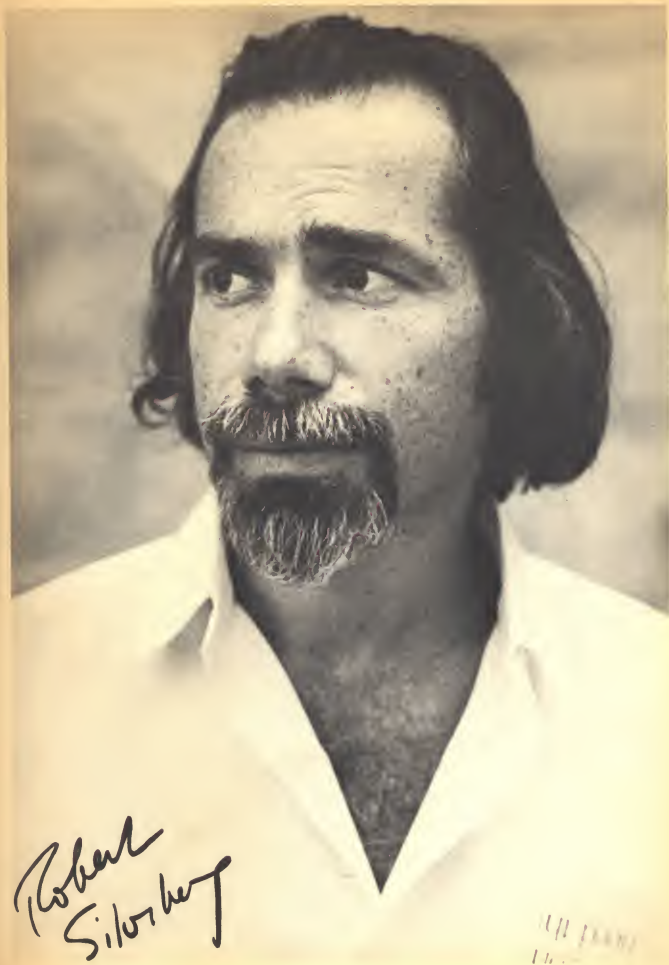
Robert Silverberg

It is a matter of great importance that Robert Silverberg no longer writes. Insisting he has not turned his back on the genre, he continues to labor on behalf of the industry by editing science fiction and making it his reading of choice. "It's a Personal Decision," he writes, "not a Statement."

As a figure in the history of science fiction, he defies brief characterization. Attempting to catalog his novels, we lost count at two dozen. His honors and awards include two Hugos, four Nebulas, Guest of Honor at the 1970 World Science Fiction Convention, and past Presidency of the Science Fiction Writers of America. He has written at least five non-fiction books, incidentally, on subjects ranging from pre-Columbian America to Medieval Africa.

Underlining his commitment to the field of science fiction, Mr. Silverberg's editorial work has always addressed itself to the task of bringing literate but unsung writers to the attention of an outside world. His books include: *The Masks of Time*, *Son of Man*, *A Time of Change*, *Tower of Glass*, *The World Inside*, *Downward to the Earth*, *The Man in the Maze*, *Revolt on Alpha C*, *The Silent Invaders*, and *Nightwings*.

Classified/Star Chamber





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